Vol. 934 Number 1

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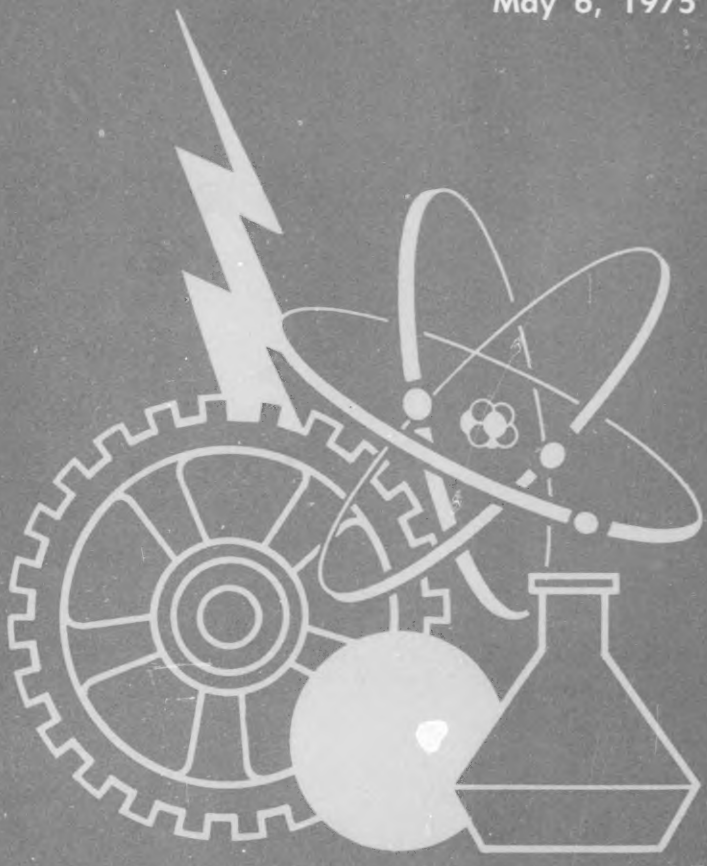
PATENTS

May 6, 1975



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May 6, 1975 Volume 934 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Express Abandonments

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138.

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(i) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application. The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 7, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,824,011, B. E. Williams, METHOD OF CLOTHING MEAT, **filed** June 28, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–1482–LTL, *Bemis Company, Inc. and Beverly E. Williams* v. *Chromalloy American Corporation*. Filed stipulation for dismissal of complaint and defendant's counterclaim without prejudice, entered Dec. 3, 1974 .

2,936,008, D. E. Brown, MOBILE WHOLE-TREE WOODCHIPPER UNIT; **3,661,333**, L. N. Smith, TREE DESTROYER, **filed** Dec. 11, 1974, D.C., N.D. Ala. (Birmingham), Doc. 74–P–1307–S, *Morbark Industries, Inc.* v. *Bush Manufacturing Company, Inc.*

3,144,149, Dempster, Herpich and Harvey, TRANSPORTING EQUIPMENT FOR CONTAINERS; **3,229,622**, French and Toppins, STATIONARY PACKER ASSEMBLIES, **filed** July 25, 1974, U.S. Court of Claims, Doc. 267–74, *Carrier Corporation* v. *The United States.*

3,153,436, R. G. Chesley, SPIRAL MEAT SLICER, **filed** May 4, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–1005 AAH, *Mary Jane Schmidt, as trustee of the revocable living trust of Harry J. Hoenselaar* v. *C. Vincent Zazzare, individually and doing business as Mission Honey Hams et al.* Consent judgment, patent is valid; defendants are permanently enjoined from infringing upon said patent. However, defendant may continue using the "spiral meat slicer" until June 10, 1975. The cause of action for patent infringement against defendants is hereby dismissed with prejudice, nunc pro tunc, as of Dec. 10, 1974.

3,229,622. (See 3,144,149.)

3,289,108, Davey and Saltzberg, AUTOMATIC ADJUSTMENT OF TRANSVERSAL FILTER SO THAT RECEIVED PULSE IS CORRECTED TO CONFORM WITH STANDARDIZED SHAPE; **3,292,110**, Becker, Lucky and Port, TRANSVERSAL EQUALIZER FOR DIGITAL TRANSMISSION SYSTEMS WHEREIN POLARITY OF TIME-SPACED PORTIONS OF OUTPUT SIGNAL CONTROLS CORRESPONDING MULTIPLIER SETTING; **3,368,168**, R. W. Lucky, ADAPTIVE EQUALIZER FOR DIGITAL TRANSMISSION SYSTEMS HAVING MEANS TO CORRELATE PRESENT ERROR COMPONENT WITH PAST, PRESENT AND FUTURE RECEIVED DATA BITS; **3,375,473**, same, AUTOMATIC EQUALIZER FOR ANALOG CHANNELS HAVING MEANS FOR COMPARING TWO TEST PULSES, ONE PULSE TRAVERSING THE TRANSMISSION CHANNEL AND EQUALIZER; **3,414,819**, same, DIGITAL ADAPTIVE EQUALIZER SYSTEM; **3,515,805**, Fracassi and Savage, DATA SCRAMBLER; **3,573,668**, Bender, Hirsch and Rudin, Jr., SYSTEM FOR ADAPTIVELY EQUALIZING A DATA SIGNAL HAVING A CLOSED DATA EYE; **3,740,843**, Roycraft and Sheehan, DIGITAL AMPLITUDE MODULATOR; **Re. 27,047**, R. W. Lucky, DIGITAL ADAPTIVE EQUALIZER SYSTEM; **Re. 27,250**, same, ADAPTIVE EQUALIZER FOR DIGITAL TRANSMISSION SYSTEMS HAVING MEANS TO CORRELATE PRESENT ERROR COMPONENT WITH PAST, PRESENT AND FUTURE RECEIVED DATA BITS, **filed** Dec. 10, 1975, D.C., S.D. Fla. (Miami), Doc. 74–1601–C–Ca, *Western Electric Co., Inc.* v. *Milgo Electronic Corp. and International Communications Corp.*

3,292,110. (See 3,289,108.)

3,304,565, H. Fuhring, CLEANING INSTALLATIONS FOR VEHICLES, **filed** Jan. 7, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c64, *The Allen Group, Inc.* v. *Nu-Starr, Inc.*

3,339,474, Lamp, Jr., Anderson and Hagenauer, APPARATUS FOR TRANSPORTING PLANT AND ANIMAL MATERIALS; **3,453,119**, J. N. McGill, STORAGE OF FRESH LEAFY VEGETABLES; **3,834,577**, R. Tempero, PORTING APPARATUS FOR A REFRIGERATED STORAGE CHAMBER, **filed** Jan. 7, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–37 WPG, *Transfresh Corporation* v. *Atcon Corporation.*

3,363,422, L. A. Turzillo, METHOD AND APPARATUS FOR ANCHORING A TIE-DOWN BAR IN AN EARTH SITUS; **3,464,216**, same, METHOD AND MEANS FOR FORMING CAST-IN-PLACE REINFORCED CONCRETE PILE, **filed** Jan. 8, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–0045 WHO, *Lee A. Turzillo and Lee Turzillo Contracting Company* v. *P & Z Co., Inc.*

3,368,168. (See 3,289,108.)

3,375,473. (See 3,289,108.)

3,389,814, J. H. Lemelson, LOAD RESPONSIVE CONTROL MEANS FOR A MATERIAL HANDLING APPARATUS; **3,402,835**, S. Saul, CONTROL SYSTEM FOR A ZONED AUTOMATIC WAREHOUSE ARRANGEMENT; **3,486,640**, J. H. Lemelson, MULTI-SPEED CONTROL SYSTEM FOR A LOAD CARRIER IN A WAREHOUSE SYSTEM, **filed** July 30, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2157, *The Triax Company* v. *Conco, Inc.*

3,402,835. (See 3,389,814.)

3,411,501, S. Greenberg, THERMOPLASTIC MOUTHPIECE AND METHOD OF MAKING SAME, filed Apr. 27, 1972, D.C., E.D. Pa. (Philadelphia), Doc. 72–832, *Samuel Greenberg and Right-Gard Corporation* v. *Croydon Plastics Co., Inc. Matthew Dobrowolski and Safe-Play Manufacturing Co., Inc.* Order, Claim 9 of said patent is declared invalid for obviousness under 35 U.S.C. 103. Judgment is entered for the defendants on all counts of the complaint with the exception of that portion which seeks injunctive relief and damages for the misappropriation and misuse of the plaintiffs' secret method of flavoring mouthguards made of Alathon 3180 thermoplastic, June 27, 1974.

3,414,819. (See 3,289,108.)

3,416,507, A. J. Little, ETHER INJECTION ASSEMBLY FOR INTERNAL COMBUSTION ENGINE, filed Dec. 15, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c3174, *Stewart Warner Corporation* v. *Colt Industries Operating Corp.* Defendant's counterclaims are dismissed with prejudice and without costs, Jan. 2, 1975.

3,428,333, V. E. Nelson, TOW-TYPE SECTIONAL AUTOMATICALLY FOLDABLE HARROW CART, filed Apr. 26, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1158, *Gladys Nelson Howen* v. *Clark Equipment Company.* Motion of defendant to transfer is granted and cause ordered transferred to USDC, District of Minnesota, Sixth Division, Jan. 3, 1975.

3,453,119. (See 3,339,474.)

3,464,216. (See 3,363,422.)

3,486,640. (See 3,389,814.)

3,515,805. (See 3,289,108.)

3,530,887, P. E. Stratman, QUICK DISCONNECT COUPLING; **3,646,964,** same, COUPLING DEVICE FOR PERMITTING COUPLING UNDER TRAPPED PRESSURE; **Re. 27,635,** L. A. Kopaska, COUPLING DEVICE, filed Apr. 5, 1974, D.C., W.D. Pa. (Pittsburgh), Doc. C.A. 74–0026, *Parker-Hannifin Corporation* v. *Snap-Tite, Inc.* Case dismissed, Dec. 27, 1974.

3,545,154, Bobzin and Sawyer, SURFACE PANEL ASSEMBLY WITH RIGID STRIPS TO CONCEAL FASTENERS, filed Jan. 7, 1975, D.C., N.D. Ind. (South Bend), Doc. S75–4, *The Celotex Corporation* v. *Bendix Homes Systems, Inc.*

3,564,495, Gould and Gould, PEDESTRIAN TRAFFIC CONTROL SIGNAL UNIT, filed July 19, 1974, D.C., N.D. Ohio (Cleveland), Doc. C–74–644, *Indicator Controls Corporation* v. *Winko-Matic Signal Co.* Same, filed July 17, 1974, D.C. C.D. Calif. (Los Angeles), Doc. 74–2033–DWW, *Indicator Controls Corporation* v. *Sesco, Inc.* Filed consent judgment and order thereon enjoining defendant from infringing plaitiff's U.S. patent, entered Dec. 27, 1974.

3,573,668. (See 3,289,108.)

3,601,202, H. Steffe, RIDGE LEVELER AND STALK COVERER, filed Feb. 12, 1973, D.C., N.D. Iowa (Sioux City), Doc. 73–C–3014–W, *Harlan E. Steffe,* v. *Lundell Manufacturing Company, Inc.* Stipulation enjoining defendant from infringing plaintiff's patent. Plaintiff's complaint shall stand dismissed with prejudice in its entirety. Defendant's Counterclaim shall stand dismissed without prejudice, Dec. 11, 1974.

3,646,964. (See 3,530,887.)

3,654,579, Kurtz, Mallon and Gravel, ELECTROMECHANICAL TRANSDUCERS AND HOUSINGS; **3,706,953,** Kicks and Louth, PARTICLE IMPACT PROTECTORS AND ASSEMBLIES THEREOF FOR PRESSURE SENSING TRANSDUCERS HAVING DIAPHRAGMS; **3,753,196,** Kurtz, Gravel and Mallon, Jr., TRANSDUCERS EMPLOYING INTEGRAL PROTECTIVE COATINGS AND SUPPORTS, filed Nov. 26, 1974, D.C.N.J. (Newark), Doc. 74–1847, *Kulite Semiconductor Products, Inc.* v. *Entran Devices, Inc.* Order entering default of defendants for failure to appear; and for permanent injunction, Jan. 15, 1975.

3,661,333. (See 2,936,008.)

3,689,123, L. C. Barbieri, TRACK LAYING ATTACHMENT FOR A VEHICLE, filed Jan. 15, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–99 AJZ, *Louis Barbieri* v. *Harold Firstenberg.*

3,690,231, L. Storch, PHOTOCOMPOSITION ERROR CORRECTION SYSTEM, filed Jan. 8, 1975, D.C., N.D. Ga. (Atlanta), Doc. C75–38A, *Leonard Storch* v. *Automix Keyboards, Inc.*

3,706,953. (See 3,654,579.)

3,749,843. (See 3,289,108.)

3,753,196. (See 3,654,579.)

3,770,550, M. D. Levitan, PACKET-TYPE LAMINATING MACHINE, filed Dec. 31, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3792, *Thermal Laminating Corporation* v. *Laminex, Inc.*

3,774,785, A. J. Gasseling, KILN LAYING APPARATUS, filed Jan. 7, 1975, D.C., E.D. Wash. (Spokane), Doc. C75–1, *Allen J. Gasseling* v. *Ronald Riel and Alice Riel.*

3,807,229, W. E. Chiles, BYPASS FLOWMETER, filed Jan. 11, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c103, *Max Von Radics et al.* v. *Trippe Manufacturing Company.* Filed plaintiffs' voluntary dismissal of action under Rule 41(a)(1), FRCP, Jan. 10, 1975.

3,834,577. (See 3,339,474.)

3,843,293, W. H. Harville, MACHINE FOR MOLDING PLASTIC ARTICLE, filed Jan. 2, 1975, D.C., W.D. Tenn. (Memphis), Doc. C–75–1, *H & L Distributing Co.* v. *Strike King Lure Co.*

Re. 27,047. (See 3,289,108.)

Re. 27,250. (See 3,289,108.)

Re. 27,635. (See 3,530,887.)

D. 217,942, N. P. Angelakos, ASHTRAY, filed Nov. 28, 1972, D.C., S.D.N.Y., Doc. 72–5038, *Lancaster Colony Corporation* v. *Aldon Accessories Ltd. and Royal London Ltd.* Judgment of said District Court be and it hereby is affirmed with costs to be taxed against the appellants, entered Jan. 10, 1975.

D. 232,075, H. Cooper, BOTTLE, filed Oct. 10, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2928, *Dog n Suds, Inc.* v. *Howard Cooper.* Case closed pursuant to Rule 41(a)(i), Jan. 8, 1975.

Certificates of Correction for the Week of May 6, 1975

3,586,011	3,833,384	3,856,335	3,865,484
3,626,753	3,833,644	3,856,464	3,865,489
3,674,816	3,834,813	3,856,639	3,865,631
3,677,384	3,835,435	3,856,858	3,865,697
3,700,717	3,836,654	3,856,983	3,865,787
3,710,915	3,837,331	3,857,020	3,865,960
3,745,594	3,840,577	3,857,213	3,866,144
3,746,663	3,840,655	3,857,281	3,866,317
3,747,076	3,841,722	3,857,333	3,866,511
3,755,552	3,842,040	3,857,355	3,866,693
3,759,368	3,842,075	3,857,797	3,866,891
3,759,874	3,842,129	3,857,848	3,866,935
3,761,843	3,842,199	3,858,197	3,867,120
3,764,505	3,842,547	3,859,117	3,867,327
3,765,446	3,844,496	3,859,195	3,867,395
3,779,064	3,844,781	3,859,325	3,867,501
3,780,907	3,844,791	3,860,412	3,867,571
3,786,437	3,845,162	3,860,569	3,867,812
3,788,784	3,845,249	3,860,794	3,867,822
3,791,107	3,845,472	3,860,880	3,868,140
3,793,147	3,846,378	3,860,887	3,868,187
3,794,961	3,846,740	3,861,331	3,868,369
3,796,412	3,847,257	3,861,550	3,868,584
3,797,926	3,847,656	3,861,857	3,868,758
3,798,440	3,848,453	3,861,909	3,868,779
3,800,770	3,848,511	3,861,948	3,869,002
3,802,720	3,848,646	3,862,100	3,869,038
3,809,158	3,849,338	3,862,110	3,869,272
3,810,885	3,850,547	3,862,174	3,869,386
3,811,419	3,851,286	3,862,240	3,869,424
3,813,251	3,851,760	3,862,241	3,869,651
3,815,992	3,851,842	3,862,242	3,869,759
3,818,038	3,852,318	3,862,386	3,869,831
3,819,686	3,852,414	3,862,393	3,870,076
3,820,140	3,853,013	3,862,519	3,870,098
3,821,131	3,853,025	3,862,839	3,870,282
3,823,032	3,853,728	3,863,030	3,870,477
3,823,403	3,853,935	3,863,217	3,870,674
3,823,662	3,853,973	3,863,331	3,870,774
3,824,310	3,855,238	3,863,764	3,870,830
3,825,544	3,855,456	3,864,318	3,871,158
3,825,596	3,855,541	3,864,661	3,871,207
3,825,599	3,855,697	3,864,768	3,871,838
3,825,943	3,855,811	3,864,775	3,872,385
3,828,750	3,855,897	3,865,216	3,872,397
3,828,856	3,856,144	3,865,455	3,872,440

Corrected Disclaimer

3,704,155.—*Bror E. Anderson*, Arlington Heights, and *Margery L. Schick*, Mount Prospect, Ill. THERMOGRAPHIC STENCIL SHEET AND METHOD OF MAKING AN IMAGED STENCIL SHEET. Patent dated Nov. 28, 1972. Disclaimer filed Jan. 24, 1974, by the assignee, *Weber Marking Systems, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to Sept. 26, 1989.

Disclaimers

3,416,169.—*Edward A. Smeloff*, Sacramento, *Trevor B. Davey*, Carmichael, and *Boris Kaufman*, Sacramento, Calif. DOUBLE-CAGE HEART VALVE WITH CONTOURED OVERSIZE ORIFICE. Patent dated Dec. 17, 1968. Disclaimer filed Sept. 3, 1974, by the assignee, *Sutter Hospitals Medical Research Foundation.*

Hereby enters this disclaimer to claims 7, 8 and 15 of said patent.

3,706,236.—*Joseph Pickles*, Birmingham, Mich. TAILGATE WINDOW REGULATOR. Patent dated Dec. 19, 1972. Disclaimer filed Nov. 11, 1974, by the assignee, *Ferro Manufacturing Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

Dedications

3,118,567.—*Meigs W. Newberry*, East Longmeadow, Mass. ARTICLE DISPENSING MECHANISM. Patent dated Jan. 21, 1964. Dedication filed Oct. 7, 1974, by the assignee, *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,125,245.—*Meigs W. Newberry*, East Longmeadow, Mass. ARTICLE DISPENSING MECHANISM. Patent dated Mar. 17, 1964. Dedication filed Oct. 7, 1974, by the assignee, *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,189,218.—*Francis A. Gasparini* and *John A. Gormley*, Springfield, Mass. DISPENSING APPARATUS. Patent dated June 15, 1965. Dedication filed Oct. 7, 1974, by the assignee, *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,240,386.—*Graham S. McCloy*, Columbus, Ohio. VENDING APPARATUS. Patent dated Mar. 15, 1966. Dedication filed Oct. 7, 1974, by the assignee, *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,278,079.—*Gilbert M. Guard*, Chicopee Falls, Mass. VENDING MACHINE INTERLOCK. Patent dated Oct. 11, 1966. Dedication filed Oct. 7, 1974, by the assignee, *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,334,786.—*Meigs W. Newberry*, East Longmeadow, Mass. VENDING MACHINE. Patent dated Aug. 8, 1967. Dedication filed Oct. 7, 1974, by the assignee, *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,341,069.—*Meigs W. Newberry*, East Longmeadow, Mass. DOUBLE ROW CAN VENDOR. Patent dated Sept. 12, 1967. Dedication filed Oct. 7, 1974, by the assignee *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,406,776, L. Henry, ACOUSTIC METHOD AND APPARATUS FOR EXAMINING FORMATIONS ADJACENT THE WALLS OF BOREHOLES, Interference No. 96,981, decided Jan. 9, 1975, claims 7 and 17–19.

Patent No. 3,423,242, W. F. Meyers and J. W. Simmons, ELECTRIC CURRENT-PRODUCING CELL WITH ANHYDROUS ORGANIC LIQUID ELECTROLYTE, Interference No. 96,883, decided July 9, 1971, claim 17.

Patent No. 3,499,445, J. O. Reed, ANIMAL HUSBANDRY, Interference No. 97,754, decided Feb. 8, 1974, claims 1, 2 and 3.

Patent No. 3,509,305, R. B. Bertolasi, RANDOM GAP PULSING SYSTEM FOR EDM, Interference No. 97,991, decided Oct. 8, 1974, claims 1–10.

Patent No. 3,522,069, J. C. Checko and H. Umansky, METHOD FOR THE PREPARATION AND APPLICATION OF FOAMED MAGNESIA CEMENTS, Interference No. 97,774, decided Jan. 14, 1975, claims 1–7.

Patent No. 3,530,443, H. S. Crafts, W. B. Sander, J. B. Angell, MOS GATED RESISTOR MEMORY CELL, Interference No. 98,329, decided Dec. 18, 1974, claims 1, 2, 5, 6, 9, 14, 16 and 26–28.

Patent No. 3,547,996. M. W. Bullock, D1 2-{2-[(β-HYDROXYPHENETHYL)AMINO]ETHYL} - 2 - THIOPSEUDOUREA AND HYDROCHLORIDE SALT THEREOF, Interference No. 98,765, decided Jan. 24, 1975, claim 1.

Patent No. 3,595,477, G. Wollin and D. B. Ericson, FOG DISPERSING METHOD AND COMPOSITIONS, Interference No. 98,107, decided Oct. 17, 1974, claims 1, 5, 9 and 11.

Patent No. 3,651,349, D. Kahng and E. H. Nicollian, MONOLITHIC SEMICONDUCTOR APPARATUS ADAPTED FOR SEQUENTIAL CHARGE TRANSFER, Interference No. 98,199, decided Sept. 26, 1974, claims 5–8.

Patent No. 3,653,747, H. W. Kogelnik, FOCUSING DEVICE FOR COLOR TELEVISION CAMERAS, Interference No. 98,418, decided Jan. 17, 1975, claims 1 and 3.

Patent No. 3,691,476, I. Hayashi, DOUBLE HETEROSTRUCTURE LASER DIODES, Interference No. 98,390, decided Dec. 6, 1974, claim 7.

Patent No. 3,699,873, A. H. Irvin, AIR FLOW CONTROL APPARATUS, Interference No. 98,763, decided Jan. 24, 1975, claim 1.

Patent No. 3,715,600, J. C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of J. M. Weingart and R. K. Yasui, STACKED SOLAR CELL ARRAYS, Interference No. 98,539, decided Dec. 16, 1974, claims 1, 2, 4, 6 and 7.

Patent No. 3,727,684, B. D. Terral and P. Hewitt, DUPLEX MANDREL FOR A CROSSOVER SYSTEM, Interference No. 98,744, decided Jan. 24, 1975, claims 1 and 2.

Patent No. 3,744,228, E. C. Lundahl, COMPACTING SYSTEM FOR STACKING BULK HAY, Interference No. 98,673, decided Jan. 8, 1975, claims 13 and 16.

Patent No. 3,780,212, W. E. Glenn, Jr., COLOR FILTER AND SINGLE TUBE COLOR TELEVISION CAMERA SYSTEM UTILIZING SAME, Interference No. 98,746, decided Jan. 24, 1975, claims 1–5, 7, 9–12, 14, 16 and 17.

Patent No. 3,800,225, D. J. Meares, DIFFERENTIAL PULSE-CODE MODULATION, Interference No. 98,741, decided Jan. 30, 1975, claims 1, 2, 4, 5 and 10–13.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 12, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-3-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-15-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-11-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-27-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-7-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	9-25-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-15-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-12-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-18-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-23-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-12-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	8-6-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-31-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-5-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-23-74

Expiration of patents: The patents within the range of numbers indicated below expire during May 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 600, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,832,959, to 2,836,825 inclusive
Plant Patents..... Numbers 1,698, to 1,713 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MAY 6, 1975

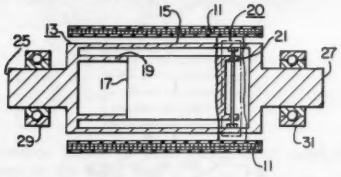
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T934,001
SUPERCONDUCTIVE DYNAMOELECTRIC MACHINE WITH IMPROVED CRYOGENIC SUPPORT ARRANGEMENT

Donald C. Litz, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1973, Ser. No. 398,023
Int. Cl. H02k *9/00*
U.S. Cl. 310—52
1 Sheet Drawing. 18 Pages Specification

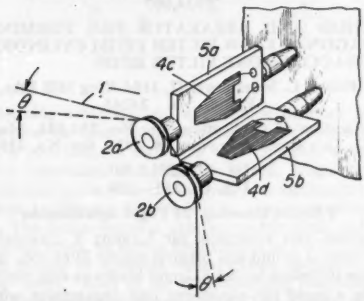


A superconducting dynamoelectric machine has a cryogenic portion of the rotor supported on the ambient temperature portion of the rotor by relatively long and thin spokes. The spokes extend between the ambient temperature portion and a flange located on a cryogenic temperature portion. The materials of the flange and spokes are selected so that contraction of the spokes along their length will be compensated for by contraction of the flange in that direction. Contraction in the transverse direction is compensated for by an appropriate displacement of the end of the spoke connected to the ambient temperature portion. Alignment and tension of the spoke is accurately achieved by an appropriate adjusting arrangement.

T934,002
TENSOMETER

George Cheatham Trail, Jr., 138 Dovershire Drive, Matthews, N.C. 28105

Continuation of application Ser. No. 292,569, Sept. 27, 1972. This application Sept. 24, 1973, Ser. No. 400,452
Int. Cl. G01l *5/10*
U.S. Cl. 73—144
1 Sheet Drawing. 10 Pages Specification



An improved electro-mechanical threadline-tensometer that gives an indicated tension that is largely independent of the error angle between the calibration position and the actual position of the tensometer in use, is provided by having at least one pair of conventional strip-cantilever tensometer heads mounted perpendicular to each other. In the most preferred embodiment the axes of heads are merely parallel rather than being in-line, and the calibration position is such that the calibrating load causes equal deflection in each of the strip cantilevers. The percentage error in indicated tension, caused by an error angle of θ in positioning the tensometer in actual use, is less than 0.5% for θ of $\pm 5°$; less than 1.5% for θ of $\pm 10°$; and less than 3.5% for θ of $\pm 15°$.

T934,003
PROCESS FOR PREPARING POWDERS

Harris N. Stephens, Jr., 921 Glade Mill Drive, Kingsport, Tenn. 37663, and Melvin D. Fink, 2309 Lakespur Drive, Johnson City, Tenn. 37601

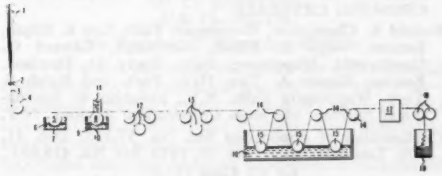
Filed Feb. 22, 1974, Ser. No. 444,939
Int. Cl. B22d *23/08*
U.S. Cl. 264—9
No Drawing. 8 Pages Specification

A process is disclosed for dyeing a bundle of dry-spun acrylonitrile polymer filaments after the filaments have been extruded through a spinneret from a solution of the polymer in a solvent therefor, and before the solvent remaining after the spinning step has been extracted. The extruded but unextracted filaments are passed over a rotating roll wetted with dye solution, preferably after moistening them by passing them over a rotating roll wetted with water, and are then drawn in air about 1.5× to 2.0×. Preferably, the extrusion, dyeing, and drawing steps are carried out continuously. Temperature conditions are not critical. After the filaments are dyed and drawn, they can be washed to remove spinning solvent and can be drawn further during the wash step.

T934,004
PROCESS

Allen Leroy Blancett, Camden, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 1, 1974, Ser. No. 447,255
Int. Cl. D06p *5/00*
U.S. Cl. 8—17
1 Sheet Drawing. 13 Pages Specification



A coordination catalyst system useful at high temperatures, e.g., 75° C., for making elastomeric high molecular weight copolymers of ethylene and at least one alpha-monoolefin of the formula $R—CH_2—CH=CH_2$ wherein

R can be hydrogen or an alkyl group of 1 to 15 carbon atoms, said catalyst system consisting essentially of (a) titanium tetrabromide, (b) a diorganoaluminum bromide containing 1 to 18 carbon atoms, e.g., disobutylaluminum bromide, (c) a diorganomagnesium compound represented by the formula R_1R_2Mg wherein R_1 and R_2 are alkyl, cycloalkyl, aralkyl, alkaryl, alkenyl, aryl substituted alkenyl, or cycloalkenyl, and R_1 and R_2 contain a total of 8 to 30 carbon atoms, e.g., *n*-butyl-*sec*-butylmagnesium, (d) as a modifier to raise the copolymer molecular weight, an aliphatic ether of the formula R'OR'' wherein R' and R'' represent alkyl groups each having 2 to 5 carbon atoms, and (e) an inert organic diluent, e.g., hexane, with the proviso that the ratios of magnesium atoms to titanium atoms and aluminum atoms to titanium atoms in the catalyst system are in accordance with the following relationships:

$$Al:Ti = A(2\text{–}30):1$$

$$\text{minimum } Mg:Ti = M_{min.} = 0.135A + \frac{0.15}{Q}$$

$$\text{maximum } Mg:Ti = M_{max.} = 0.826A + \frac{0.05}{Q}$$

where Q is the concentration of Ti (in millimoles/liter) in the reactor liquid phase and ranges from 0.05 to 0.2 and the moles of ether:atom of magnesium being in the range (0.5–1.5):1. The preferred catalyst has components in these proportions: Al:Mg:Ether:Ti=6:3:3:1. It is preferred that the catalyst be formed *in situ* by separate introduction of hydrocarbon solutions of each component; however, catalyst components can be premixed.

T934,005
COORDINATION CATALYST

James W. Crary, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 381,769, July 23, 1973. This application June 12, 1974, Ser. No. 478,788

Int. Cl. C08f *3/02*
U.S. Cl. 260—88.2

No Drawing. 16 Pages Specification

A process of producing fine particles of thermoplastic polymeric material is disclosed in which a thermoplastic polymeric material and an anionic surfactant are dispersed in a liquid which is not a solvent for said thermoplastic material at a temperature above the melting point of the polymeric material. The dispersion is agitated to form fine molten particles of said polymeric material in said dispersion, and is subsequently rapidly cooled to thereby solidify said particles of polymeric material and prevent agglomeration.

T934,006
COMPUTER CONTROL FOR REAL TIME DETERMINATION OF RESISTIVITY OF EPITAXIALLY GROWING CRYSTALS

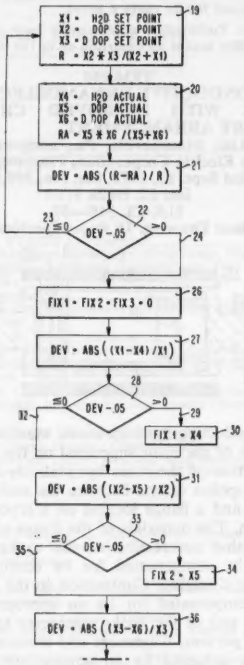
Ronald E. Chappelow, Wappingers Falls, Leo E. Elijah, Beacon, Virgil L. Elliott, Newburgh, Edward G. Grochowski, Wappingers Falls, Harry D. Harrison, Beacon, Homer A. Tice, Hyde Park, and Ralph S. York, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 97,235, Dec. 11, 1970. This application Nov. 19, 1973, Ser. No. 416,893

Int. Cl. G06f *15/46*
U.S. Cl. 235—151.1

4 Sheets Drawing. 29 Pages Specification

Method for the real-time control of the resistivity of an epitaxially growing crystal by a specially programmed process control computer. The diluent hydrogen, the arsenic dopant and the diluted arsenic dopant gas flow rates of a silicon tetrachloride-arsine reaction system are controlled simultaneously toward values determined in accordance with respective monotonic functions of a parameter S satisfying the relationships between the aforesaid three gas flow rates and the resistivity value of the epitaxial layer. The actual gas flow rates are monitored at predetermined intervals during epitaxial growth and



a computed resistivity function R thereof is compared to the same computed function based upon desired gas flow rates. Any deviation in excess of a preestablished amount causes the computer to increment the value of the parameter S until a new realizable combination of gas flow rate values is found which would restore the desired resistivity value of the growing epitaxial layer.

T934,007
METHOD AND APPARATUS FOR FORMING A DIAGONAL FLOW FILTER FROM CYLINDRICAL TOBACCO SMOKE FILTER RODS

Robert C. Mumpower II, 2104 King Mill Pike, Bristol, Va. 24201

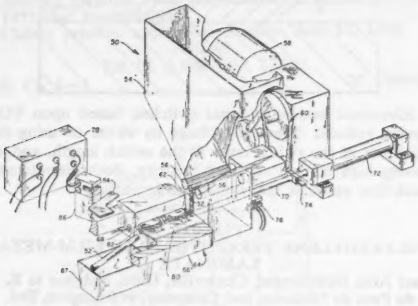
Continuation of application Ser. No. 234,434, Mar. 13, 1972. This application Nov. 28, 1973, Ser. No. 419,757

Int. Cl. B29j *5/00*
U.S. Cl. 264—109

5 Sheets Drawing. 21 Pages Specification

Method and apparatus for forming a diagonal flow filter from a cylindrical tobacco smoke filter rod, the apparatus including heated indenter blades or dies positioned within a mold for movement into engagement with the exterior surface of a filter rod to form in the filter rod one or more oppositely disposed first and second indentations of predetermined lengths and widths. The first and

second indentations each extend longitudinally along the length of the filter rod and extend from the surface of the filter rod into the body of the filter rod to predetermined depths along such predetermined lengths. Each of the first indentations is offset with respect to each of the second indentations in a direction parallel to the longitudinal axis of the filter rod. One or more secondary, shorter indentations may be provided to alter to some degree the smoke flow by causing in the resulting filter some smoke to be diverted toward the shorter indentations. The indenter blades or dies remain in such engagement for a



predetermined length of time sufficient to mold the indentations in the filter rod.

T934,008

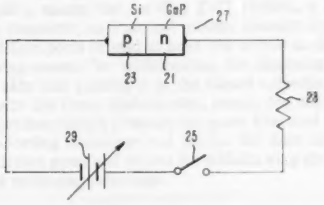
HETEROJUNCTION SWITCHING AND MEMORY DEVICE

Harold J. Hovel, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 242,145, Apr. 7, 1972, which is a continuation-in-part of application Ser. No. 46,943, June 17, 1970. This application Feb. 11, 1974, Ser. No. 441,712

Int. Cl. H03k *17/56, 17/70*
U.S. Cl. 357—16

2 Sheets Drawing. 38 Pages Specification



A bistable switching and non-volatile memory device which may be read either destructively or non-destructively is provided, as shown in FIG. 5, using a heterojunction consisting of a heavily doped, single crystal, semiconducting material in electrical and mechanical contact with a different, high resistivity, semiconducting material. The heterojunction exhibits stable high and low impedance states, as shown for example in FIG. 2, due to a high density of material imperfections, including deep energy "traps," both at the heterojunction interface and in the high resistivity grown region. The density of material imperfections including double or more acceptor-like traps may be of the order of $10^{-18}cm^{-3}$ or greater.

T934,009

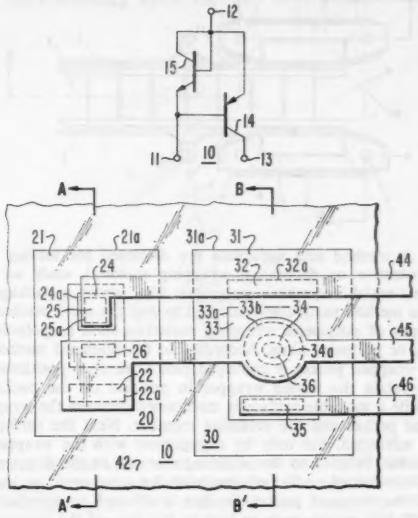
COMPOSITE TRANSISTOR

Abel Ching Nam Sheng, Morris Plaines, N.J., assignor to RCA Corporation

Filed Apr. 11, 1974, Ser. No. 459,953

Int. Cl. H01l *19/00*
U.S. Cl. 357—44

2 Sheets Drawing. 10 Pages Specification



The composite transistor integrated within a common semiconductor body comprises a common-emitter amplifier connection of a lateral-structure transistor with its base-emitter junction paralleled by a diode-connection of a vertical-structure transistor. The magnitude of the "common-emitter forward current gain" of the composite transistor is the ratio of a saturation current of the lateral-structure transistor to the saturation current of the vertical structure transistor, which current gain is shown to be independent of temperature.

T934,010

LAMINATED ROLL

Michael John Maskornick, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

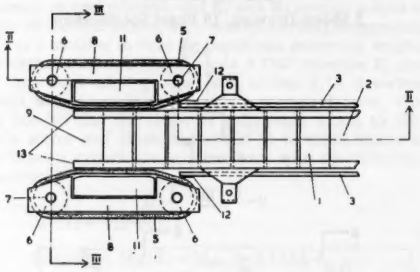
Continuation-in-part of abandoned application Ser. No. 307,952, Nov. 20, 1972. This application May 24, 1974, Ser. No. 473,224

Int. Cl. B32b *27/06*
U.S. Cl. 29—130

No Drawing. 17 Pages Specification

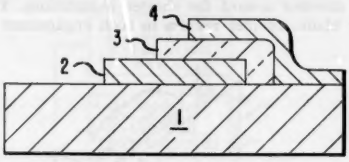
A very useful laminated roll which has as its essential components (A) a cylindrical metallic core, (B) a layer of adhesive adhering to and substantially surrounding said core and (C) a perfluorinated elastomer layer adhering to and substantially surrounding said adhesive layer, said perfluorinated elastomer being an elastomeric copolymer of tetrafluoroethylene, a perfluoroalkyl perfluorovinyl ether and optionally a suitable functionally substituted perfluoroalkyl perfluorovinyl ether. Rolls of this invention have beneficial utility as adhesive application rolls, textile finishing rolls, fuser rolls for office copying machines, and the like.

T934,011
PACKET SEALER
Peter Wray, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England
Filed June 24, 1974, Ser. No. 482,602
Int. Cl. B65b *51/18*
U.S. Cl. 53—39
2 Sheets Drawing. 21 Pages Specification



A method and apparatus are disclosed for sealing a protective or decorative wrapping material, such as a heat-sealable synthetic polymeric film, about a package, the method particularly adapted to seal the more resilient types of polymeric wrapping materials such as polyolefin or polyester films. According to the disclosed method a wrapped packet is conveyed past a member positioned to retain the folded wrapper in position on the packet while a movable surface is maintained between the wrapped packet and the retaining member. Next the surface is advanced, but only by engagement with the wrapped packet, relative to the retaining member in the direction of motion of and at substantially the same speed as that of the wrapped packet. Sealing is effected by supplying sufficient energy such as heat to the area of the wrapper in contact with the moving surface to seal the wrapper in that area of contact.

T934,012
SWITCH OF REDUCED THRESHOLD VOLTAGE
Stephen Charles Thayer, Lewistown, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of abandoned application Ser. No. 378,056, July 11, 1973. This application July 25, 1974, Ser. No. 491,670
Int. Cl. B32b *9/04*
U.S. Cl. 357—4
1 Sheet Drawing. 11 Pages Specification



Electronic and/or thermal switches, based upon VO_2, having reduced threshold voltage by virtue of using the thickness of the switch layer as the switch length, and/or having high current carrying capacity. Both discrete and thick-film switches are within the invention.

T934,013
POLYETHYLENE TEREPHTHALATE FILM-METAL LAMINATE
Carl John Heffelfinger, Circleville, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of abandoned application Ser. No. 342,422, Mar. 19, 1973. This application July 31, 1974, Ser. No. 493,738
Int. Cl. B32b *15/08*
U.S. Cl. 428—458
No Drawing. 5 Pages Specification

A laminated structure of a metal layer, e.g., copper, aluminum or silver, and a layer of unoriented, crystalline polyethylene terephthalate having an intrinsic viscosity of at least about 0.7 (preferably between 0.85 and 1) and a degree of crystallinity of at least about 20% (preferably 25 to 65%).

REISSUES

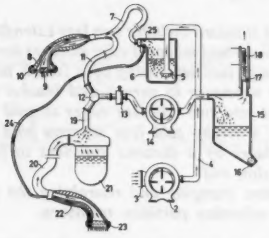
MAY 6, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,405
APPARATUS FOR WASHING PATIENTS HYGIENICALLY

Soren Sollerud, Norrkoping, Sweden, assignor to Svenska Utvecklingsaktiebolaget, Stockholm, Sweden

Original No. 3,574,239, dated Apr. 13, 1971, Ser. No. 786,988, Dec. 26, 1968. Application for reissue Nov. 9, 1972, Ser. No. 305,001
Claims priority, application Sweden, Jan. 12, 1968, 448/68
Int. Cl. A47k *7/00, 17/00*
U.S. Cl. 4—1 20 Claims



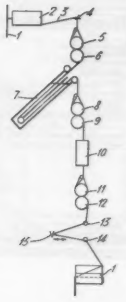
1. Apparatus for washing patients hygienically with minimum disturbance of the patient comprising a closed container for a washing liquid containing a small amount of a surface-active agent, means for compressing air, means for supplying compressed air from said compressor means to said closed container in an atomized state to form a cleansing foam of the washing liquid, at least one application nozzle having *at least one* outlet *port* [ports] and *at least one* suction *port* [ports], two flexible tubular elements, one of said tubular elements connecting the outlet ports of said at least one nozzle to said closed container for supplying foam under pressure to the outlet ports of said nozzle for application of cleansing foam to the patient's skin, means for creating [of] suction, a closed collecting container, said second tubular element connecting the suction ports of said at least one nozzle to the suction-creating means for withdrawing the cleansing foam from the skin and passing it to the closed collecting container where the foam disintegrates, means for withdrawing at a predetermined pressure the gases liberated in said closed collecting container and means for heat cleaning said withdrawn gases and means for withdrawing the liquid from said collecting container.

28,406
PROCESS FOR PRODUCING TEXTURED YARN

Michel Buzano, Villeurbanne, France, assignor to Rhone-Poulenc-Textile S.A., Paris, France

Original No. 3,772,747, dated Nov. 20, 1973, Ser. No. 84,131, Oct. 26, 1970, which is a division of Ser. No. 814,465, Mar. 17, 1969. Application for reissue Apr. 22, 1974, Ser. No. 463,138
Claims priority, application France, Mar. 18, 1968, 144,238
Int. Cl. D02j *1/22*
U.S. Cl. 28—72.17 6 Claims

1. A process for the production of continuous filament polyester fancy yarns having improved softness and dyeing properties, comprising subjecting an initially unstretched continuous filament polyester yarn first to partial stretching by a factor of 2.5–3.5 x in a bath of a crack-producing agent and then to a supplementary stretch in the absence of such agent by a continuously varying factor, and before or after the supplementary stretch giving the yarn a relaxing heat treatment while allowing it to shrink.



28,407
APPARATUS FOR CULTIVATING PLANTS

Jorg Kuhn, Alpsteinstrasse 56, CH–9100, Herisau, Switzerland, and Elmar Sohm, am Wiesengrund 7, A6923 Lauterach, Austria

Original No. 3,717,953, dated Feb. 27, 1973, Ser. No. 197,432, Nov. 10, 1971, which is a continuation-in-part of abandoned application Ser. No. 4,918, Jan. 22, 1970. Application for reissue Feb. 25, 1974, Ser. No. 445,698
Int. Cl. A01g *1/04, 9/24*
U.S. Cl. 47—1.1 24 Claims

22. In a method of cultivating plants disposed in rows of stacked receptacles containing said plants, said receptacles being stored in an elongated enclosure of channel-shaped configuration having a pair of generally parallel, opposed side walls, the steps of:

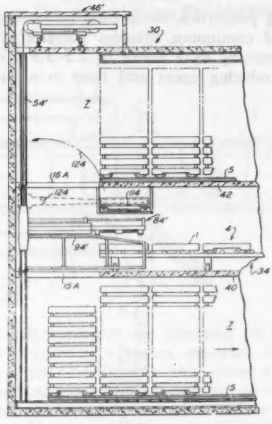
spacing said stacked receptacles top-to-bottom to define a plurality of first air channels each having a first height,

spacing said stacked receptacles with respect to at least one of said side walls to define a second air channel communicating with each of said first channels, said second air channel having a width less than the combined height of said first channels,

flowing conditioned air through said second channel at at a first velocity to each of said first channels for flow therethrough at a second velocity lower than said first velocity,

exhausting air from each of said first channels into a third air channel which is parallel to said second channel after passage over a single receptacle, there-

by to enhance the effectiveness of the air flow across said plants in removing unwanted gases, and



withdrawing air from said third channel in a direction substantially parallel to said one side wall.

28,408

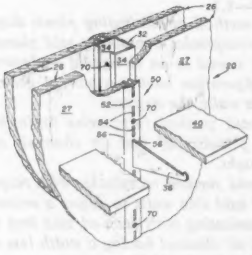
BRACKET STANDARD AND PARTITION MEMBER RETAINER

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Original No. 3,685,234, dated Aug. 22, 1972, Ser. No. 87,035, Nov. 5, 1970. Application for reissue May 11, 1973, Ser. No. 359,366

Int. Cl. A47g *29/02*; E04b *2/72*

U.S. Cl. 52—36 **6 Claims**



8. A wall assembly comprising

upper and lower runners disposed in spaced-apart relationship from one another generally in the same plane,

a plurality of studs extending between said runners with respective ends thereof engaging said runners, said studs having surfaces for supporting partition members,

a plurality of partition members mounted in adjoining edge-to-edge relationship on the supporting surfaces of said studs, the adjacent edge surfaces of adjacent partition members being spaced apart from each other so as to define, in combination with one of said supporting surfaces of one of said studs, an elongate slot,

a plurality of bracket standards, each of said bracket standards contacting two adjacent edges of said partition members,

attachment means securing each of said bracket standards to one of said studs whereby said bracket standards hold said partition members in contact with said supporting surface of said studs, and

a plurality of shelf brackets removably engaging said standards by extension of a portion of said shelf bracket through said standard and into said elongate slot,

wherein said standard includes two legs extending therefrom between said adjacent edge surfaces toward said stud surface, said legs being of a length no greater than that necessary to permit said bracket standard to contact said two adjacent edges of said partition members, whereby said legs separate said adjacent edge surfaces by a distance sufficient to form said elongate slot, and

integral means engaging and restraining the face surfaces of adjoining partition members.

28,409

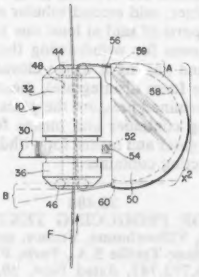
TWISTER AND METHOD OF TWISTING

Richmond T. Leeson, East Greenwich, and Hans H. Richter, Warwick, R.I., by Leesona Corporation, Warwick, R.I., assignee

Original No. 3,668,855, dated June 13, 1972, Ser. No. 48,167, June 22, 1970. Application for reissue May 4, 1973, Ser. No. 357,244

Int. Cl. D02g *1/02, 1/04*

U.S. Cl. 57—77.4 **27 Claims**



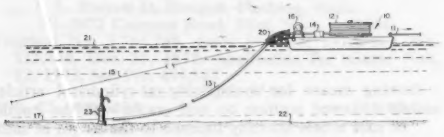
1. A method of processing a strand capable of receiving twist comprising the steps of: providing a rotatable member having spaced apart *ring-like* frictional surfaces thereon, directing said strand in a first path to engage *a first* of said surfaces, directing said strand in a second

path to engage a second of said surfaces, rotating said member to thus drive said surfaces and insert twist into said strand, and tensioning said strand during twisting thereof.

28,410
TENSION PIPE LAYING METHOD

Harold D. Cox, Metairie, La., Dillard S. Hammett, Houston, Tex., J. Ronald Dozier, Tulsa, Okla., and Howard L. Shatto, Jr., La Jolla, Calif., assignors to Shell Oil Company, New York, N.Y.

Original No. 3,331,212, dated July 18, 1967, Ser. No. 353,979, Mar. 23, 1964. Application for reissue May 28, 1968, Ser. No. 741,836
Int. Cl. B63b *35/04;* **F16l** *1/00*
U.S. Cl. 61—72.3 **13 Claims**



1. A method of laying a pipeline on the floor of a body of water from a vessel floating on said body, said method comprising:

(a) anchoring one end of the pipeline to the floor of the body of water;

(b) moving the vessel in the direction it is desired to lay the pipeline and paying out the end of the pipeline anchored to the floor of said body of water;

(c) controlling the paying out of the pipeline and movement of the vessel to hold the pipeline under preselected tension sufficient to maintain the bending and axial stresses applied thereto within a predetermined range;

(d) terminating the pipeline on the vessel at the length thereof desired to be laid, thus forming another end;

(e) securing a drawline between said other end of the pipeline and the vessel; and,

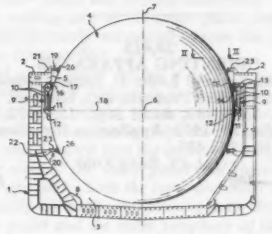
(f) paying out the drawline to lower said other end of the pipeline to the floor of the body of water, the paying out of the drawline being controlled to hold the pipeline under preselected tension sufficient to maintain the bending and axial stresses applied thereto within a predetermined range.

28,411
METHOD AND DEVICE FOR SUPPORTING A CONVEYED TANK AGAINST ROLL AND PITCH

Jean H. Alleaume, Saint Cloud, France, assignor to Technigaz, Paris, France

Original No. 3,712,257, dated Jan. 23, 1973, Ser. No. 104,239, Jan. 6, 1971. Application for reissue June 27, 1973, Ser. No. 374,036
Claims priority, application France, Apr. 30, 1970, 7016004
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 A **13 Claims**

1. An auxiliary device for supporting a tank against roll and pitch and associated with a system of main movable and substantially vertical suspension supports, said device comprising at least one set of stationary bearing members substantially adjacent to one another and distributed along the periphery of said tank at least approximately in one and the same relative horizontal plane, each bearing member comprising a substantially triangular bracket support comprising in particular two overhanging rods, a stationary external structure spaced from said tank, [respectively at two, at least horizontally spaced points of the tank located respectively on either side of the normal relative vertical plane passing through said member], one of the ends of said rods being connected to said structure, said rods *projecting respectively from two at least horizontally spaced points of said structure located respectively on either side of the normal rela-*

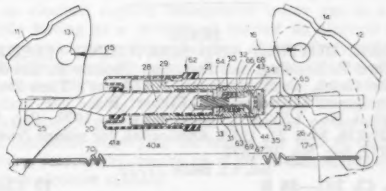


tive vertical plane passing through said member and said rods converging towards said plane, a guiding element interconnecting the other ends of said rods in said plane, a [force-] *forced* guiding bearing solid with said tank with which said element cooperates, each guiding bearing having a guiding path forming a slideway constituted by a rectilinear elongated recess forming a substantially horizontal straight slot with parallel opposite edges, the longitudinal plane of symmetry of said slot being in said normal relative vertical plane, said guiding element constantly engaging said slideway with bilateral contact while moving in said normal relative vertical plane.

28,412
BRAKE ADJUSTERS

Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Original No. 3,680,664, dated Aug. 1, 1972, Ser. No. 64,518, Aug. 17, 1970. Application for reissue Dec. 19, 1973, Ser. No. 426,345
Claims priority, application Great Britain, Aug. 21, 1969, 41,756/69
Int. Cl. F16d *65/56*
U.S. Cl. 188—79.5 GT **24 Claims**



17. A slack adjuster for a brake system comprising a first non-rotatable member, a second rotatable member

and a third non-rotatable member having a common thrust axis; a non-reversible screw-thread connection between said first and second members, said second member being axially displaceable and rotatable relative to said third member; a fourth rotatable member coaxial with said thrust axis; a reversible screw-thread connection between said fourth member and one of said second and third members; axially cooperating friction surfaces between said fourth member and the other of said second and third members; and a spring acting on said fourth member to urge said fourth member into a resting position when the brake system is released, said spring acting in an axial direction to urge said friction surfaces on said other member and said fourth member towards one another.

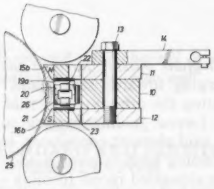
28,413
ORIENTING APPARATUS

John S. Evans, Jr., and Leslie L. Jasper, Houston, Tex., assignors to Mark Products, Inc., Houston, Tex.

Original No. 3,690,487, dated Sept. 12, 1972, Ser. No. 148,041, May 28, 1971. Application for reissue Dec. 4, 1972, Ser. No. 311,481

Int. Cl. B65g *7/00*

U.S. Cl. 214—340 **17 Claims**



16. Apparatus for orienting a generally cylindrically shaped member to a preselected position comprising means for rotating the member on its longitudinal axis including two spaced rollers to engage the member and rotate it on its longitudinal axis, means for reducing the atmospheric pressure on the opposite side of the rollers from the member to cause the member to be held against the rollers by the pressure differential so created, and means for stopping the rollers when the member is in the desired orientation, said means for stopping the rollers including means providing a magnetic field through which the member moves as it is rotated and means sensitive to a change in the field by a known discontinuity in the member to stop the rollers a preselected period of time after said change occurs to position the member in the desired orientation.

28,414
FABRIC CUTTING AND MEASURING MACHINE

Clifford E. Keesling, San Jose, and Thomas B. Keesling, Los Gatos, Calif., assignors to Moore's Time-Saving Equipment Company, Inc., Elkhart, Ind.

Original No. 3,537,662, dated Nov. 3, 1970, Ser. No. 730,836, May 21, 1968. Application for reissue Nov. 1, 1972, Ser. No. 302,872

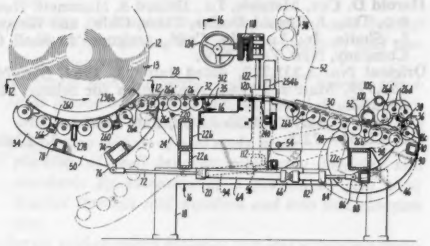
Int. Cl. B65h *19/20*

U.S. Cl. 242—56 R **17 Claims**

1. Apparatus for conveying a generally cylindrical object in a direction generally parallel to its length which comprises:

an elongated concave cradle adapted to support a cylindrical object in a generally horizontal position with the length of said object generally parallel to the length of the cradle;

conveying means in said cradle for rotating a cylindrical object on said cradle in a direction transverse to the length of the cradle; and



skewing means for maintaining a cylindrical article in a skewed position on said cradle with the length of said article laterally inclined to the length of said cradle while said article is being rotated by said conveying means.

28,415
BLINK COMPENSATING APPARATUS AND METHOD FOR OBJECTIVE REFRACTOR FOR THE EYE

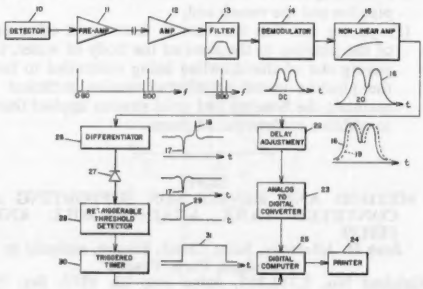
Bruce R. Robinson, Penfield, Charles R. Munnerlyn and Terrance N. Clapham, Fairport, and James W. Horwitz, Rochester, N.Y., assignors to Tropel, Inc., Fairport, N.Y.

Original No. 3,802,768, dated Apr. 9, 1974, Ser. No. 353,649, Apr. 23, 1973. Application for reissue June 10, 1974, Ser. No. 478,062

Int. Cl. A61b *3/10;* **G01j** *5/28*

U.S. Cl. 351—6 **19 Claims**

10. A method of compensating for a blink occurring



during examination of an eye by an automatic instrument directing radiant energy into said eye, said method comprising:

(a) producing a signal as a function of radiant energy reflected from said eye;

(b) detecting a rate of change of said signal exceeding a predetermined threshold and representing the beginning of a blink;

(c) producing a blink commencement signal upon detection of said blink; and

(d) using said blink commencement signal to stop said examination of said eye during said blink.

14. In an instrument for automatically examining an eye by directing radiant energy into said eye, a blink compensating system comprising:

(a) means for producing a signal as a function of radiant energy reflected from said eye;

(b) means for detecting a rate of change of said signal exceeding a predetermined threshold and representing the beginning of a blink;

(c) means for producing a blink commencement signal upon detection of said blink; and

(d) means responsive to said blink commencement signal for stopping said examination of said eye.

28,416

ANNULAR HOLE CUTTER

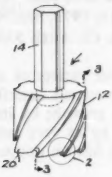
Everett D. Hougen, Flushing, Mich.

(G-5072 Corunna Road, Flint, Mich. 48504)

Original No. 3,765,789, dated Oct. 16, 1973, Ser. No. 213,430, Dec. 29, 1971. Application for reissue Nov. 12, 1973, Ser. No. 414,927

Int. Cl. B23b *51/04*

U.S. Cl. 408—204 **35 Claims**



40. An annular hole cutter comprising:

(a) a generally circular cylindrical side wall having a plurality of cutting teeth spaced around the lower end thereof and having means at the upper end for mounting the cutter on a rotary driving member;

(b) each tooth having an inner cutting edge extending generally radially outwardly from the inner periphery of said side wall and an outer cutting edge extending radially inwardly from the outer periphery of said side wall;

(c) all of said inner cutting edges being disposed at substantially the same height so as to penetrate into the material being cut to substantially the same depth and all of said outer cutting edges being disposed at substantially the same height so as to penetrate into the material being cut to substantially the same depth when the cutter is rotated and fed axially into the workpiece, whereby the cutting load is substantially the same on all of the inner cutting edges and the cutting load is substantially the same on all of the outer cutting edges;

(d) the inner cutting edge of each tooth being staggered circumferentially forwardly in the direction of rotation of the cutter at its radially outer end relative to the radially inner end of the outer cutting edge on each tooth and being spaced substantially closer to the outer cutting edge of its respective tooth than to the outer cutting edge of the next successive tooth;

(e) the circumferential space between the cutting edges of successive teeth comprising radially inner and outer gullets, said inner gullet extending upwardly from said inner cutting edge and having a radially inner wall which tapers radially outwardly in an upward direction, said outer gullet extending upwardly from said outer cutting edge and radially inwardly from the outer periphery of said side wall, said inner gullet opening outwardly into said outer gullet, said outer gullet having a radially inner wall spaced radially outwardly from the inner wall of said inner gullet and extending upwardly substantially beyond said inner gullet and beyond said teeth;

(f) the trailing face of the outer gullet being staggered circumferentially rearwardly from the trailing face of the inner gullet;

(g) said outer gullet having a radial dimension and a circumferential dimension at least as large as the effective length of the inner cutting edge so as to accommodate the flow of chips cut by the inner cutting edge and directed into the outer gullet by the radially inner wall of the inner gullet and thereby discharge the chips cut by both the inner and outer cutting edges upwardly through the passengeway defined by the outer gullet and the outer periphery of the groove cut by said teeth.

28,417

METHOD AND APPARATUS FOR DETECTING TRACER GAS

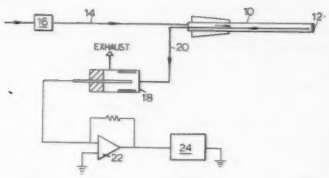
Anthony Jenkins and Richard C. Cornell, Royston, England, assignors to Analytical Instruments, Ltd., Royston, England

Original No. 3,699,342, dated Oct. 17, 1972, Ser. No. 63,571, Aug. 13, 1970. Application for reissue May 21, 1973, Ser. No. 362,432

Claims priority, application Great Britain, Apr. 27, 1970, 20,180/70

Int. Cl. G01c *1/18*

U.S. Cl. 250—302 **5 Claims**



1. A method of detecting and monitoring the presence of an electron capture halogenated tracer gas in a gas supply having as a constituent thereof an electron capture material, comprising the steps of selectively isolating said halogenated tracer gas from the remainder of the supply by diffusion through a membrane formed from a silastomer having a greater permeability to said halogenated tracer gas than to the remainder of the supply, and thereafter conveying the tracer gas into an electron capture detector by means of a gas stream substantially inert to electron capture.

PLANT PATENTS

GRANTED MAY 6, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,713
STRAWBERRY PLANT
Herschel L. Boll, R.R. 4, Champaign, Ill. 61820
Filed Nov. 14, 1973, Ser. No. 415,496
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by its everbearing habit of growth; by its high productivity; by its vigorous growth; by its continuous bearing of fruit from June until freezing weather; by its runners usually producing flower buds before roots; and by its medium red, glossy, very firm, evenly colored, and very attractive fruit.

3,714
STRAWBERRY PLANT
Herschel L. Boll, R.R. 4, Champaign, Ill. 61820
Filed Nov. 14, 1973, Ser. No. 415,497
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by its high productivity, by its vigorous growth, and by its early season of maturity.

3,715
STRAWBERRY PLANT
Herschel L. Boll, R.R. 4, Champaign, Ill. 61820
Filed Nov. 14, 1973, Ser. No. 415,498
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by its everbearing habit of growth, by its high productivity, by its vigorous growth, and by its early season of maturity.

3,716
STRAWBERRY PLANT
Albert B. Cook, R.R. 1, Box 191, Grandview, Ind. 47615
Filed Nov. 15, 1973, Ser. No. 416,294
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by its extremely vigorous growth; by its very tall plants; by its very long runners; by its very large leaves; and by its very large fruit, which has an unusual and a high flavor.

PATENTS

GRANTED MAY 6, 1975

ERRATA

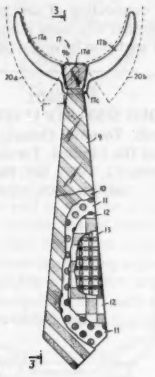
For CLASS	See PATENT NO.
032–033	3,881,254
152–361 R	3,881,492
015–327 E	3,881,535
259–004	3,881,688
252–455 R	3,881,696
075–130 R	3,881,937
250–361	3,882,028
200–016 C	3,882,056
029–025.42	3,882,059
264–024	3,882,063
240–052.1	3,882,450
360–098	3,882,473

PATENTS

GRANTED MAY 6, 1975

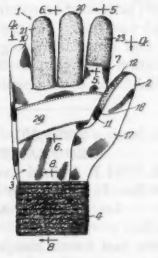
GENERAL AND MECHANICAL

3,881,196
TIE ARRANGEMENTS AND TIE-HOLDING DEVICE THEREFOR
Andrea Spada, Barros Arana 2999, Casilla 54, Arica, Chile
Filed Aug. 7, 1973, Ser. No. 386,296
Int. Cl. A41d *25/08*
U.S. Cl. 2—153 **7 Claims**



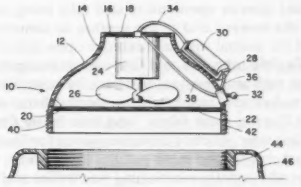
1. In combination, a plurality of separate, and independent ties of similar configuration and different decorative patterns positionable aligned with each other in superposed relationship in registry with each other, a tie-holding device for wearing of the ties on said device jointly simultaneously, said tie-holding device comprising a tie-holding means for releasably holding the ties as a plurality in superposed position and suspended in registry therefrom, and means on said device for wearing by a wearer of said device and plurality of ties.

3,881,197
HUNTER'S GLOVE
Warren L. Andrews, Chicago, Ill., assignor to Wells Lamont Corporation, Chicago, Ill.
Filed Oct. 7, 1974, Ser. No. 512,421
Int. Cl. A41d *19/00*
U.S. Cl. 2—161 A **11 Claims**



1. In a glove of the class described the combination of a hollow knitted palm portion, a plurality of hollow knitted tubular finger sections and a thumb section, said sections being joined to the palm portion, the first finger section of the palm portion being tubular and extending from the palm portion to a point substantially at the second joint of the first finger of the hand to be covered, a finger stall closed at its outer end and substantially covering the two outermost joints of said first finger and being joined to the aforesaid knitted first finger portion, said last-named joint being adapted to lie substantially at the innermost end of the second joint of the first finger of the user's hand, said first finger stall comprising stretchable walls adapted to cover the two outer joints of the trigger finger and having a granulated surface of adherent particles overlying the first and second joints of the occupying finger.

3,881,198
DETACHABLE AIR CONDITIONING UNIT FOR HEADWEAR
William A. Waters, 3648 E. 49th St., Tulsa, Okla. 74135
Filed Aug. 13, 1973, Ser. No. 387,956
Int. Cl. A42c *5/04*
U.S. Cl. 2—171.3 **7 Claims**

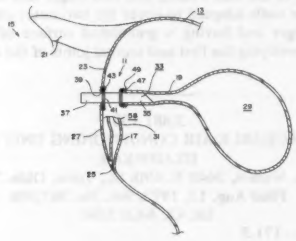


1. A detachable self-contained air conditioning unit for headwear and comprising housing means of a generally outwardly flaring configuration and having the opposite ends thereof open, a first air screen means disposed in one of said open ends, a second air screen means disposed in the other of said open ends, power means carried by said air screen and depending therefrom into the interior of the housing means, impeller means carried by the power means and interposed between the air screen means and temperature control panel means, said impeller means being rotatable by the power means for pulling air into the housing through the air screen means and discharging air from the housing through the temperature control panel means, power supply means operably connected with the power means for selective activation thereof, and securing means cooperating between the housing means and headwear for removably securing the self-contained unit to the headwear, and wherein the housing means includes an upstanding neck portion at one end having an opening therein of a smaller diameter than the opposite open housing end, said air screen means being removably secured in said neck portion opening.

3,881,199
URETHRAL SHUNT TUBE IMPLANT
James T. Treace, Memphis, Tenn., assignor to Richards Manufacturing Company, Memphis, Tenn.
Filed June 11, 1973, Ser. No. 368,655
Int. Cl. A61f *1/24;* **A61m** *27/00*
U.S. Cl. 3—1 **2 Claims**

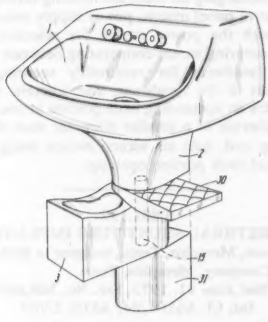
1. A surgical implant for bypassing the distal portion of the natural urethra tract to relieve urethral obstruction of certain

animals, said implant comprising a tube having an interior open end communicated with an exterior open end, a first flexible patch extending radially outwardly from said tube for attachment to the dermal layer of the animal, said first patch being provided with an aperture centrally thereof and receiving said tube therethrough, said first patch being attached to said tube adjacent said exterior end thereof, a second flexible patch extending radially outwardly from said tube for attachment to the severed end of the urethra of the animal, said second patch being provided with an aperture centrally thereof and receiving said tube therethrough, said second patch being attached to said tube intermediate the ends



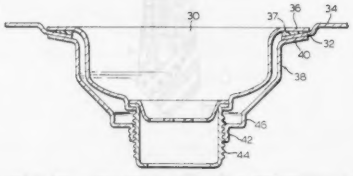
thereof, said interior open end of said tube being adapted for receiving the severed end of the urethra to communicate the bladder of the animal with said exterior open end of said tube, and said flexible tube and said first and second patches being compatible with and resistant to attack by animal body fluids, said first and second patches being formed from silicone impregnated Dacron mesh fabric, said tube being formed from silicone-elastomer, silicone adhesive means for fixedly attaching said first and second mesh patches to said tube, said adhesive means additionally establishing washerlike seal means for sealable engagement with certain portions of the animal abuttingly engaging said adhesive means.

3,881,200
WASHING APPARATUS
Hartmut-Wolfgang Maier-Gerber, Alte Ittersbacher Landstrasse 1, 7501 Karlsbad 1, Baden, Germany
Filed Mar. 19, 1974, Ser. No. 452,624
Claims priority, application Germany, Mar. 24, 1973, 2314789
Int. Cl. A47k *1/04, 3/22, 11/08*
U.S. Cl. 4—166 **4 Claims**



1. A washing apparatus comprising
a wash basin and seat washing basin combined to form a functional unit and having a single common battery of fittings for a feed of mixed water to be conducted optionally into said wash basin or into the said seat washing basin and with a common wash-water discharge,
a base under said wash basin supporting said seat washing basin such that it can be swung out of a position of rest concealed in said base into a position of use and from there back into said position of rest,
a hollow bottom part of said base being formed as a supporting arm in the form of a hollow molding which, in an axis of rotation of said seat washing basin, has a wash-water inlet which discharges into an adjoining water-collecting space,
a pump,
a pressure transmitter contained in said water collecting space for the connecting of said pump, the latter being arranged in another adjoining pump space which is separated off by a partition having a passage.

3,881,201
THREADED SINK STRAINER HOUSING
William T. Richards, Toronto, Ontario, Canada, assignor to Premier Tool and Die Limited, Toronto, Ontario, Canada
Filed Oct. 12, 1973, Ser. No. 406,037
Int. Cl. E03c *1/26*
U.S. Cl. 4—286 **9 Claims**

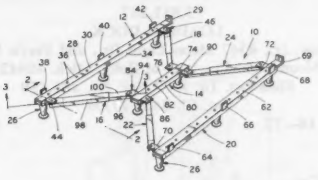


1. In a sink drain assembly, a housing, a tubular sink strainer body, for mounting through a sink drain opening in a sink, and having an annular flange at one end thereof which is adapted to contact the inner surface of a sink wall surrounding said opening and a threaded spout extending from the outer end of said sink strainer body, said housing being substantially tubular and of an interior dimension to permit positioning of said housing over the portion of said sink strainer body which projects exteriorly of said sink wall for securing said sink strainer body in said sink drain opening; the improvement comprising a circular thin-walled threaded portion provided at an end of said housing, said circular threaded portion being integral with said housing, the axis of said circular threaded portion being coincident with the longitudinal axis of said tubular portion, the threads on said circular thin-walled threaded portion being rolled threads and so dimensioned as to threadably engage said threaded spout to enable said housing to be positively advanced on rotation thereof to clamp said sink wall between said flange and the other end of said housing; said other end of said housing presenting an integral annular body portion having an inside diameter greater than the diameter of said sink drain opening.

3,881,202
BED FRAME
Stephen Tyhanic, 7761 E. Oxford Ave., Denver, Colo. 80237
Filed Feb. 21, 1973, Ser. No. 334,371
Int. Cl. A47c *19/12*
U.S. Cl. 5—176 R **5 Claims**

1. A collapsible bed frame comprising: a pair of spaced elongated parallel peripheral supports, each having the same length, each being adapted for supporting a peripheral edge of a box spring, a pair of legs connected to each of said elongated peripheral supports for holding the supports at a selected height, an elongated center support being shorter than the elongated peripheral supports, said elongated center support

adapted for supporting a central portion of the box spring positioned parallel to and between said peripheral supports within the ends of the peripheral supports, a support leg connected to said center support for holding the center support at substantially the same height as the elongated peripheral supports, a pair of connectors pivotedly connected to one end of the center support, one of said connectors being pivotedly connected to one end of one of the peripheral supports, the other of said connectors being pivotedly connected to one end of the other of the peripheral supports, a second pair of con-



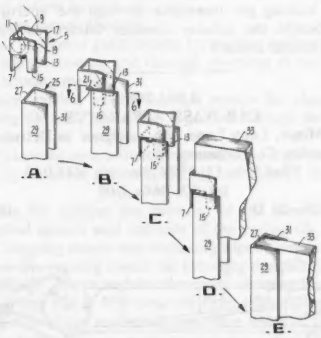
nectors pivotedly connected to the other end of the center support, one of said second pair of connectors being pivotedly connected to the other end of the one of the peripheral supports, the other of said second pair of connectors being pivotedly connected to the other end of the other of the peripheral supports, each of the connectors being adjustable in length to make the frame adjustable to receive a selected one of a plurality of sizes of box springs, and each of said connectors having a lock for releasably locking the connectors in a selected length.

3,881,203

TOOL FOR INSERTING PAPER INTO SPINES

Joe D. Giulie, Palo Alto, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 24, 1974, Ser. No. 436,217
Int. Cl. B42f *1/02*
U.S. Cl. 11—1 R **2 Claims**



1. An insertion device for inserting a sheaf of papers into a spring spine comprising in combination:

a. a flat back member,

b. arms extending at substantially right angles from the top sides of said back member, said arms extending from only the top portion of said back whereby the bottom portion of said back is free of said arms,

c. downwardly extending legs from the terminal ends of each of said side members, said legs extending downwardly to substantially the same level as said back member, said legs being spaced a substantial distance from said back member, and

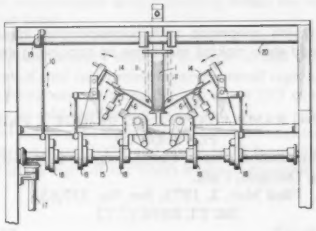
d. the upper portions of said arm member being formed outwardly at an angle to facilitate the insertion of papers therebetween.

3,881,204

MEANS FOR OPENING COVERS OF BOUND BOOKS

Toshio Sato, Tokyo, Japan, assignor to Nishioki Mfg. Co., Ltd., Tokyo, Japan

Filed June 4, 1974, Ser. No. 476,233
Claims priority, application Japan, June 4, 1973, 48-062023
Int. Cl. B42c *11/02*
U.S. Cl. 11—1 R **3 Claims**



1. A mechanism for opening covers of bound books, comprising: a conveyor means for transporting bound books one behind another in the vertically upraised position with the book spine facing downwardly, sucker discs and support members disposed on the opposite sides of said conveyor means, means for moving said sucker discs and support members downwardly outward and in the forward direction in a synchronous manner with the advancement of said conveyor means while engaging the cover sheet of a bound book on said conveyor means to achieve opening of the cover sheet, retainers disposed on the opposite sides of said conveyor means for grasping and retaining most of the leaves in the bound book in their upraised position while the cover sheet is being opened, a pair of pusher members downstream of said sucker discs and support members on respective sides of said conveyor means and movable laterally inward with respect to said conveyor means to inwardly force the leaves which have accompanied the opened cover sheet, thus causing the same to assume upwardly curved form defining hollow spaces between the cover sheet and the curved leaves, and a pair of curved guide members disposed in juxtaposition to said pusher members telescoping said guide members into the hollow spaces thus formed and means for swinging upwardly to bring the curved leaves back to the vertically upraised position.

3,881,205

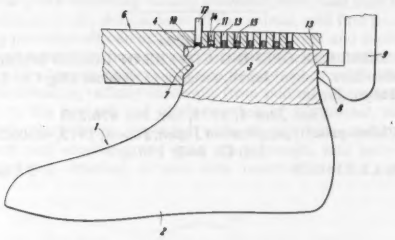
LAST FOR THE MANUFACTURE OF SHOES

Herbert Funck, Am Wasserbogen 43, 8032 Grafelfing-Lochham, Germany

Filed Apr. 26, 1973, Ser. No. 354,534
Claims priority, application Germany, May 4, 1972, 2221905; June 15, 1972, 2229307
Int. Cl. A43d *3/00*
U.S. Cl. 12—133 R **10 Claims**

1. A last for the production of shoes comprising a core portion, said core portion including a neck extending therefrom, retaining element means on said neck for rapid detachable clamping of said last in shoe making machines and conveying devices, and at least one marking on said neck, which marking comprises means for transmitting to said shoe making machines a particular characteristic of said last and for caus-

ing said shoe making machines to automatically respond to the particular characteristic of said last, said marking comprising

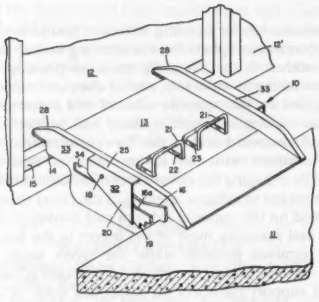


elements which cooperate with corresponding tracing elements of said shoe making machines or conveying devices.

3,881,206
LOADING RAMP ADAPTED TO BRIDGE A PAIR OF PLATFORMS

Carl O. Christensen, Alamo, Calif., assignor to Roll-Rite Corporation, Oakland, Calif.

Filed Mar. 2, 1973, Ser. No. 337,633
Int. Cl. E01d *15/12*
U.S. Cl. 14—72 **11 Claims**



1. A ramp adapted to bridge a pair of spaced platforms, one of said platforms being fixed and the other being movable, said ramp comprising:

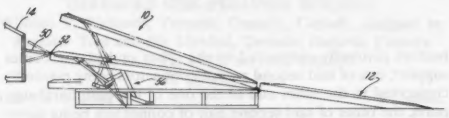
a stepped undersurface at one end adapted to engage the edge of said movable platform while the other end of said ramp is adapted to be supported on said fixed platform; and

first ramp biasing means associated with said ramp for biasing said ramp in a plurality of differing self-locking positions between said platforms, said ramp biasing means including a housing mounted on one side of said ramp, said housing having a rear wall and a top and bottom wall forming upper and lower surfaces, respectively, and being open toward the end of said ramp which is adapted to be supported on said fixed platform, at least a pair of elongated arms pivotally connected at one end within said housing vertically movable about a common horizontal axis extending generally transversely of said ramp, said arms being of differing lengths and extending out of the open end of the housing, the vertical movement of said arms being limited by their selective engagement with the upper and lower surfaces of said housing, said arms each having a plurality of downwardly extending teeth on the free ends thereof adapted to extend below the undersurface of said ramp when the arms pivot vertically downwardly into engagement with the lower surface of said housing, said teeth also varying in overall distance from said common horizontal axis, and a generally cylindrical rubberlike member disposed within said housing between said common horizontal axis and the rear wall of said housing, said cylindrical member having its longitudinal axis extending generally transverse to said ramp and generally parallel and spaced from said common horizontal axis, and said member being in contiguous relationship with the rear ends of said arms, the inner walls of both said upper and lower surfaces and said rear wall.

3,881,207
LOADING DOCK

Paul Jones, Jr., 4347 Moon Light Dr., and Ferris E. Jones, 4323 Moon Light Dr., both of Holly, Mich. 48442

Filed Oct. 10, 1973, Ser. No. 405,159
Int. Cl. B65g *11/00*
U.S. Cl. 14—72 **8 Claims**



1. A loading dock comprising:

a. a base structure,

b. a pair of spaced apart ramps pivotally mounted on the base structure for rotation between a substantially horizontal position and a substantially vertical position,

c. locking means associated with each of the ramps for positioning the ramps, the locking means being interconnected such that the locking means are simultaneously moveable to position the ramps anywhere between the horizontal and vertical position, each of the locking means comprising:

1 a tubular member pivotally connected to the base structure and having a plurality of apertures disposed therealong,

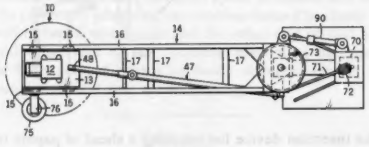
2 an extended collar pivotally connected to the ramp,

3 a locking pin insertable through the apertures, and wherein the tubular member telescopes within the extended collar.

3,881,208
CAR-WASH APPARATUS

Earl L. Miner, Long Lane, Mo., assignor to Detroit Tool & Engineering Co., Lebanon, Mo.

Filed Feb. 11, 1974, Ser. No. 441,048
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 D **10 Claims**



1. In a vehicle washing system, brush apparatus including:

a. a support,

b. an arm pivoted to the support for horizontal swinging movement,

c. a carriage mounted on said arm for movement relative thereto,

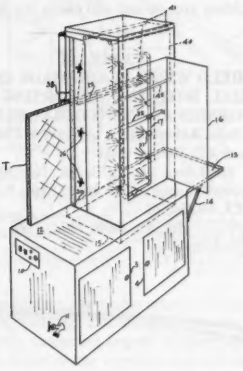
d. a rotary brush means supported by said carriage, and

e. means operatively interconnecting said carriage and said arm to move said carriage relative to said arm responsively to swinging movement of the arm.

3,881,209
DEVICE FOR CLEANING CEILING TILE

Frederick Reinitz, 5 Lothian Pl., Philadelphia, Pa. 19128, and Julian G. Czeck, 3100 Butchers Mill Rd., Norristown, Pa. 19403

Filed Aug. 24, 1973, Ser. No. 390,328
Int. Cl. A47l *25/00*
U.S. Cl. 15—102 **6 Claims**



1. A device for cleaning ceiling tiles or the like comprising:
a. support means having
b. housing means thereon,
c. upper and lower guide means for guiding ceiling tile along the support means and through openings in two sides of the housing means,
d. means carried by the support means for cleaning the ceiling tile with liquid as it is guided through the housing means,
e. said cleaning means including means for supplying cleaning liquid under pressure to only one side of the ceiling tile,
f. means for varying the pressure of the cleaning liquid supplied against said one side of the ceiling tile,
g. said cleaning means also including wiper means mounting within the housing means for retaining the cleaning liquid inside said device and for removing cleaning liquid from the ceiling tile as it is removed from the housing means,
h. barrier means extending the entire width of the inside of the housing means to contain cleaning liquid inside the housing means and on only one side of the ceiling tile,
i. collar means connected to the lower guide means to form drain slots for containing cleaning liquid on only one side of the ceiling tile,
j. means for collecting cleaning liquid used in cleaning the tile,
k. filter means for cleaning the cleaning liquid present in the collecting means,
l. means for regulating the amount of cleaning liquid in said device, and
m. means for circulating the cleaning liquid from the filter means through the means for supplying cleaning liquid under pressure against one side of the ceiling tile.

3,881,210
FLUSHABLE, PRE-MOISTENED, SANITARY WIPER AND METHOD OF MANUFACTURING SAME

John E. Drach, Philadelphia, Pa., and Clifford John Roberts, Jr., Turnersville, N.J., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Mar. 24, 1972, Ser. No. 237,859
Int. Cl. B08b *1/00;* **B32b** *3/30, 7/14*
U.S. Cl. 15—104.93 **7 Claims**

1. A flushable, pre-moistened wiper usable for cleansing parts of the human body and capable of being packaged in a wet condition for its required life without disintegrating, said wiper comprising:
A. a reinforcing layer of water-dispersible thermoplastic material having opposed major surfaces, said reinforcing layer being dispersible upon being subjected to the moisture encountered during flushing within the vortex of a toilet bowl;
B. a web of soft, fibrous material of high flexibility and water absorbency adhered to each of said opposed surfaces of said reinforcing layer in spaced regions comprising from between about 3% and about 25% of the surface area of said reinforcing layer; and
C. said continuous webs having a moisture content of from between about 100% and about 350% by weight based on the dry weight of the fibers in the continuous webs.

3,881,211
GREASE MOP FOR DIETARY CONTROL

Herbert M. Rhodes, New Orleans, La., assignor to Pro Diet Mop, Inc., New Orleans, La.

Filed Nov. 15, 1973, Ser. No. 416,217
Int. Cl. A47l *13/20;* **E02b** *15/04*
U.S. Cl. 15—225 **3 Claims**

1. An oil or grease mop for dietary control when cooking foods containing oil or grease comprising:
a. a thin long flat base strip of polypropylene,
b. branch strips extending off one side of said strip spaced along said strip at substantially uniform spacings,
c. a plurality of sub-branches extending off each branch strip,
d. said flat base strip being wound in a volute curve so that all depending branches are not placed in radial alignment, and
e. handle means secured to said volute wound base strip on the side of said flat base strip opposite to the side from which said branch strips extend.

3,881,212
WIPER BLADE

Ake Ingemar Regler, Stocksund, Sweden, assignor to Safety Vehicles Development AB, Stocksund, Sweden

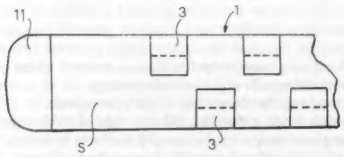
Filed Aug. 17, 1973, Ser. No. 389,427
Claims priority, application Sweden, Aug. 23, 1972, 10939/72; Sept. 25, 1972, 13779/72
Int. Cl. B60s 1/46
U.S. Cl. 15—250.04 9 Claims

1. In a wiper blade of elastic material for cleaning of, for example, windshields in vehicles, comprising a body which, via a connecting portion carries a contact member intended for contact with the object to be cleaned and which is mountable by means of an anchor member in a holder which moves back and forth across the object to be cleaned, there being in the body a longitudinal conduit from which cleaning liquid can flow out on both sides of the contact member via channels, the contact member being constructed with sealing surfaces which, when the contact member is bent out from a middle position to a position to one side of the medial plane sealingly abut corresponding sealing surfaces of the body, thereby allowing the liquid to flow out on only the front side of the wiper blade relative to the direction of motion at that time; the improvement in which the channels opening on the same side of the contact member open into a groove which widens in a direction away from the medial plane, and the sides of which form the sealing surfaces, the sealing surfaces of the body and the contact member as well as the contact surface lying on the same side of a plane which is perpendicular to the medial plane and which intersects the region where the connecting portion of the contact member joins the body.

3,881,213
BLADE CARRIER FOR THE WINDSHIELD WIPERS OF MOTOR VEHICLES

Lodovico Tilli, Turin, Italy, assignor to Bre Landiere S.A.

Filed Mar. 2, 1973, Ser. No. 337,494
Claims priority, application Italy, Mar. 24, 1972, 22354/72; May 4, 1972, 23901/72
Int. Cl. B60s 1/04, 1/38
U.S. Cl. 15—250.42 3 Claims



1. A blade carrier for a windscreen wiper of a motor vehicle, comprising (a) an elongated body for connection to a wiper arm, said body being formed as a single arcuate piece of an elastically flexible plastic material having a first plurality of hook-shaped retaining members spaced apart from one another along the concave side of said body, and a second plurality of hook-shaped retaining members spaced apart from one another along said concave side and arranged to define with said first plurality a holding groove for receiving and retaining the rear portion of a conventional windscreen wiper blade, and (b) first and second terminal holding means at opposite respective ends of the blade carrier for retaining the ends of the windscreen wiper blade, that hook-shaped retaining member which is nearest the first terminal holding means being spaced from said first terminal holding means by a distance greater than that separating adjacent hook-shaped retaining members of the first or second plurality, whereby a space is provided between said first terminal holding means and the hook-shaped retaining member nearest thereto so that the rear portion of the blade may be inserted by way of said space into the holding groove and slid along the holding groove.

3,881,214
WINDSHIELD WIPER BLADE MADE OF SYNTHETIC MATERIAL, WITH THE SUPPORTING STRUCTURE FORMED AS AN INTEGRAL ELEMENT

Attilio Dal Palu, Almese, Italy, assignor to Fister S.n.c. di Bosso Giacomo & C., Torino, Italy

Filed Aug. 31, 1973, Ser. No. 393,687
Claims priority, application Italy, Sept. 9, 1972, 69870/72; May 7, 1973, 68264/73
Int. Cl. B60s 1/04, 1/38
U.S. Cl. 15—250.42 8 Claims

1. Windshield wiper blade, comprising a supporting structure having fixed on it a rubber element provided with an active edge which is apt to slide on the glass, said supporting structure being hinged to an attachment element which is apt to be fixed to a driving arm of the windshield wiper device, said supporting structure having a substantially constant cross section, and in the lower portion of said supporting structure being formed a continuous channel having a T-shaped cross section, in the interior of which channel being accomodated a corresponding projection of said rubber element, also having a T-shaped cross section, and in the upper wall of said continuous channel being formed a plurality of inner recesses or reliefs, said recesses presenting a height decreasing progressively as they approach the ends of said supporting structure, and the distance between two adjacent recesses being also decreasing progressively as they approach said ends, said recesses allowing the supporting structure to be deformed substantially in directions contained within the center line plane passing through said windshield wiper blade and said active edge of the rubber element,

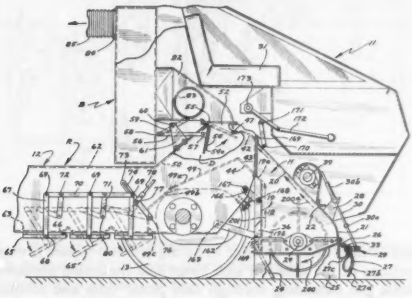
3,881,215
SURFACE CLEANING APPARATUS

Keith N. Krier, Hopkins, and Paul W. Kimzey, St. Louis Park, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Dec. 19, 1972, Ser. No. 316,457
Int. Cl. A47l 9/00
U.S. Cl. 15—340 9 Claims

1. A surface cleaning machine comprising a mobile vehicle having a frame, a downwardly opening debris pick up housing, said housing having a debris outlet, first means for mounting said housing on the frame, a power driven surface cleaning tool rotatably mounted in the housing adjacent the surface to be cleaned for raising debris from the surface, a combination filter and light debris collection container, second means for mounting the container on the frame, a suction blower having a discharge outlet and an inlet, third means for fluidly con-

necting the blower outlet to the container, a heavy trash receptacle mounted on the frame and having an inlet, and duct means for deflecting material passing therethrough to separate heavier material from lighter material, said duct means including a duct inlet fluidly connected to the housing outlet, a duct first outlet fluidly connected to the blower inlet, a second duct outlet at a lower elevation than the first duct outlet opening to the trash receptacle inlet, a bottom wall sloped upwardly and rearwardly of the housing inlet, a duct branch having the second duct outlet, a bottom wall and a top wall sloped downwardly and rearwardly from the first duct outlet, the first duct



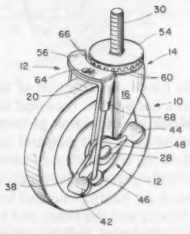
outlet being at a substantially higher elevation than the first mentioned bottom wall and extending rearwardly thereof, a transverse, vertically extending impact surface member adjacent the duct first outlet on the opposite side thereof from the duct inlet, extending to at least substantially the same elevation as the duct first outlet, and having a lower edge at a higher elevation than the lowermost part of the trash receptable inlet, and means hingedly mounting the impact member on the top wall to depend therefrom to permit pivoting of the impact member for minimizing damage to the door when hit by heavy debris.

3,881,216

CASTER BRAKE AND LATCH ASSEMBLY

Frank J. Fontana, Fairfield, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jan. 23, 1974, Ser. No. 435,687
Int. Cl. B60b *33/00*
U.S. Cl. 16—35 R **14 Claims**



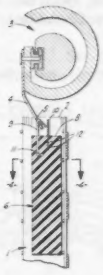
1. A brake and latch assembly, comprising; a pintle, a horn rotatably carried by said pintle, said horn rotatably carrying a wheel, brake means rotatably carried by said horn and manually rotatable for engaging the periphery of said wheel to brake said wheel, a latch member secured to said pintle for rotation with said pintle relative to said horn, a pawl, and means rotatably mounting said pawl on said horn about an axis generally parallel to the axis of said pintle independently of said brake means, said pawl being positioned to be engaged by said brake means for rotation in response to rotation of said brake means to engage said pawl with said latch member for thereafter preventing relative rotation between said pintle and horn.

3,881,217

DRAPERY HANGER

Mervin H. Bytheway, Jr., 9010 Feather River Way, Sacramento, Calif. 95826

Filed Feb. 19, 1974, Ser. No. 443,921
Int. Cl. E05d *13/02;* **A44b** *21/00*
U.S. Cl. 16—87.2 **8 Claims**



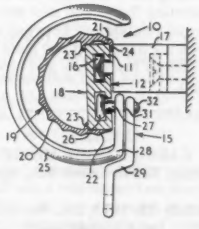
1. In the combination of a drape having horizontally spaced perpendicular roll pleats open at the upper end, and a horizontal drapery rod mounted above the drape and including depending suspension elements corresponding to the roll pleats; a drapery hanger, adapted to connect between each roll pleat and the corresponding suspension element, comprising a plug disposed in and encompassed by the roll pleat adjacent its open upper end, means securing the plug to the adjacent portion of the roll pleat, and a hook upstanding from the top of the plug and coupling in drape-suspending relation with the corresponding suspension element.

3,881,218

CURTAIN OR DRAPE SUSPENSION ARRANGEMENTS

Christopher Steven Palmer, Burton-on-Trent, England, assignor to Swish Products Ltd., Tamworth, Staffordshire, England

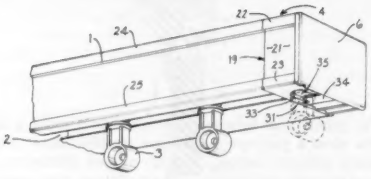
Filed Jan. 21, 1974, Ser. No. 434,958
Claims priority, application United Kingdom, Jan. 30, 1973, 4534/73
Int. Cl. A47h *15/00*
U.S. Cl. 16—93 D **10 Claims**



1. A rail for a curtain or drape suspension arrangement and including a member and an element, said element being of generally oblong recetangular cross-sectional shape thus having two wide faces, an upper and lower narrow face, said element being disposed upright in use, and said element being formed in its one wide face with a pair of superposed slots of

T-shaped cross section one of which receives and supports curtain gliders and the other of which connects to support brackets, said member having a generally semi-cylindrical outer surface and extending over the other wide face of said element, formations being provided on said member and said formations being capable of engaging said element of said rail to locate said member on said element.

3,881,219
CARRIER GATE FOR TRAVERSE ROD
Steven R. Haarer, Howe, Ind., assignor to Kirsch Company, Sturgis, Mich.
Filed July 19, 1973, Ser. No. 380,668
Int. Cl. A47h *1/04*
U.S. Cl. 16—94 D **8 Claims**



1. A gated end cap engageable with the end of a traverse rod slotted for sliding drape hangers and adapted to end abut a building wall, and snugly locate a drape edge thereagainst, said end cap including in combination:

an end plate;

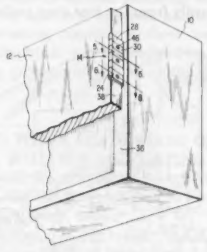
a plurality of roller supporting flanges extending perpendicularly from said end plate for telescopic cooperation with said traverse rod and at least one cord roller rotatably arranged between said flanges, said end plate, roller supporting flanges and traverse rod end defining a vertically and forwardly opening gap of width slightly exceeding that of a drape anchor hanger;

a gate in said gap forwardly and upwardly pivotable about an axis located above the bottom of the end cap, said axis being substantially perpendicular to the plane of said end plate and substantially parallel to the longitudinal extent of said roller supporting flanges, said gate having a front wall and a bottom wall, said gate when opened opening the front of said end cap and when closed providing means on said bottom wall extending across and closing the end of the traverse rod slot;

a gate mounting flange projecting forwardly into said gap and adjacent the traverse rod end from one of said roller supporting flanges, said gate mounting flange being spaced from and parallel to said end plate, a pair of pivot flanges extending from said gate for reception between said gate mounting flange and said end plate and means effecting pivotal relationship between said pivot flanges and gate mounting flange and end plate, wherein the gate pivot axis is spaced rearwardly and below the top of the gate front wall.

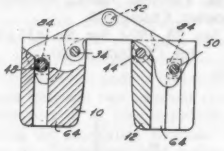
3,881,220
CABINET DOOR HINGE
Joseph Louis Kiraly, 18190 Lovell Rd., Spring Lake, Mich. 49456
Filed July 25, 1973, Ser. No. 382,572
Int. Cl. E05d *9/00*
U.S. Cl. 16—128 **3 Claims**

1. In combination with a cabinet having an open front bounded in part by opposed cabinet side panels having front edges; a cabinet door having a side edge; hinge assembly means mounting said door for movement between a cabinet closing position overlying the front edges of said side panels and an open position displaced 270° therefrom; said hinge assembly means comprising a pair of pin connected hinge leaves having interdigitated mounting portions; each said mounting portion including a pintle roll integral with planar, mutually perpendicular, proximal and distal leaf sections; fastener means securing the front edge of one of said cabinet side panels in facing relation to said distal sections of one of said hinge leaf mounting portions; fastener means securing



said cabinet door side edge in facing relation to said proximal sections of the other of said hinge leaf mounting portions; a pintle pin extending through said pintle rolls and mounting said other hinge leaf mounting portion and door for pivotal movement between a closed position defined by the respective coplanar positionment of said proximal and distal leaf sections and an open position displaced 270° therefrom.

3,881,221
INVISIBLE HINGE
Harold F. Schmidt, Warren, Mich., assignor to SOS Consolidated, Inc., Birmingham, Mich.
Filed Jan. 14, 1974, Ser. No. 432,945
Int. Cl. E05d *3/06*
U.S. Cl. 16—163 **2 Claims**

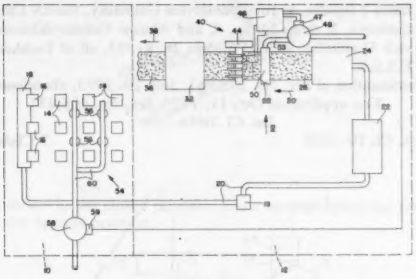


1. In an invisible hinge construction of the type including a pair of hinge blocks each to be recessed into relatively movable parts, each block having a first pivot pin adjacent a face surface parallel to the axis of hinging and each having a recess forming a slide portion, a pluraiity of interdigitally disposed contiguous sets of slide plates, each set composed of a plurality of plates and each set having one end transfixed by a pivot pin in one of said blocks and the other end transfixed by a slide pin parallel to said pivot pin, and a portion intermediate the ends transfixed by a second pivot pin parallel to said other pins and independent of said blocks, that improvement in metal hinge blocks which comprises a slide plate formed of dense, friction-reducing plastic at each end of each set of a plurality of metal slide plates, said end slide plates having a thickness approximately one-half of the metal plates whereby the two end plates take up space equivalent to one metal plate, the plastic slide plates being in sliding contact during motion of the hinge with other plastic slide plates of the contiguous sets in the hinge and with metal of the recesses in said hinge blocks.

3,881,222
METHOD AND APPARATUS FOR CONTROLLING THE MOISTURE CONTENT OF FIBROUS STOCK

James H. Roberson, Greenville, S.C., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Nov. 19, 1973, Ser. No. 417,013
Int. Cl. D01b *3/04*
U.S. Cl. 19—66 R **9 Claims**



1. A process for controlling the moisture content of fibrous stock processed from bales which comprises:

a. opening said bales of fibrous stock;

b. forming said opened stock into a substantially uniform batt;

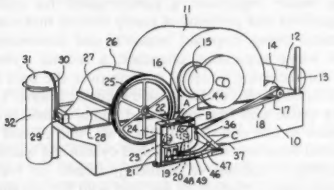
c. sensing the moisture content of said batt at a first point; and

d. applying moisture directly to said batt at a second point located upstream of said first point in accordance with the sensed moisture content at said first point.

3,881,223
CARDING MACHINE DRIVE

Thomas C. Brown, Greenville, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Aug. 27, 1973, Ser. No. 391,566
Int. Cl. D01g *15/36*
U.S. Cl. 19—106 R **2 Claims**



1. For use in a carding machine and the like having means for feeding fibers to a main cylinder and means for doffing fibers from the main cylinder in the form of a web, a drive mechanism controlling the speed of each of said means comprising:

A. a frame;

B. a drive including variable speed mechanism carried by said frame for driving connection to said feeding means and said doffing means for accelerating said feeding means and said doffing to a predetermined creep speed at a predetermined rate for driving same at a predetermined operating speed;

C. a movable control arm controlling the output speed of said variable speed mechanism; and

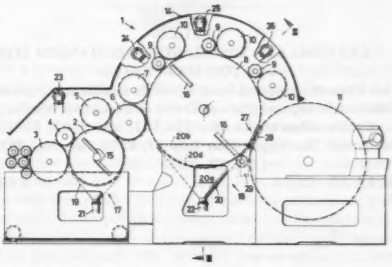
D. first and second aligned fluid operated cylinder and piston assemblies having cylinders rigidly connected to each other, said first assembly being pivoted with respect to said control arm and said second assembly being pivoted with respect to said frame, for progressively positioning said control arm in a first position responsive to the action of one of said cylinders for achieving said creep speed and in a second position responsive to the action of the other of said cylinders for achieving operating speed;

E. whereby said feeding means and doffing means may be slowly accelerated to creep speed and following servicing of the carding machine to operating speed.

3,881,224
CARDING MACHINE FOR THE TREATING OF FIBROUS MATERIAL ETC.

Walter Wirth, Dulmen, Germany, assignor to Hergeth KG Maschinenfabrik u. Apparatebau, Dulmen, Westphalia, Germany

Filed Sept. 17, 1973, Ser. No. 397,620
Claims priority, application Germany, Oct. 24, 1972, 2252081
Int. Cl. D01g *15/82*
U.S. Cl. 19—107 **5 Claims**



1. A carding machine for treating fibrous material or the like comprising at least one drum roll, a housing for said drum roll, means mounting said drum roll for rotation about a generally horizontal axis within said housing, said drum roll having a circumferential surface and axially opposite faces, vane means continguous said faces rotatable to direct currents radially outwardly relative to said axis, and funnel 8 shaped suction means projecting radially inwardly between the housing and each face of the drum roll beyond said circumferential surface and beyond the maximum diameter of the path of rotation established by said vane means for evacuating the area outboard of said faces during the rotation of said drum roll.

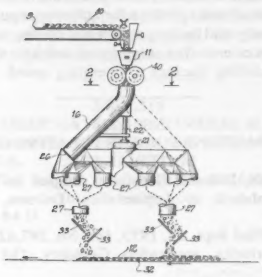
3,881,225
METHOD OF FELTING FIBROUS ELEMENTS

Robert D. Lambert, Fort Wayne, Ind., assignor to Multiply Development Corporation Ltd., Vancouver, B.C., Canada

Division of Ser. No. 233,244, March 9, 1972. This application Sept. 17, 1973, Ser. No. 398,162
Int. Cl. D01g *25/00*
U.S. Cl. 19—155 **6 Claims**

1. In the method of spreading a falling stream of particulate or fibrous material into a mat formed on a continuously moving collecting surface, the improvement comprising gathering the stream of particulate material into a compact downardly moving cylinder of material with its axis substantially coincident with that of the ingoing end of a rotating conveyor, rotating the conveyor about a vertical axis corresponding to the axis of the cylinder of material, said ingoing end being adapted to receive the stream of compacted particulate material, the outgoing end of said conveyor being adapted to successively feed increments of fibrous material in a non-

cylindrical arrangement into circularly arranged contiguous inlets of distributing conveyors adapted to convey and deposit



the material at non-contiguous positions across the collecting surface.

3,881,226

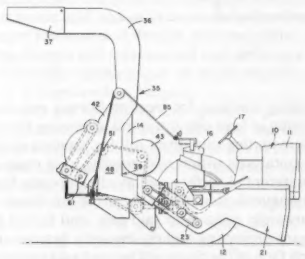
CLEANING AND DISCHARGE MECHANISM FOR COTTON HARVESTER

Brian Elwood Kent, and Leon Franklin Sanderson, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 124,161, March 15, 1971, abandoned. This application July 27, 1973, Ser. No. 383,359

Int. Cl. D01b *3/00*

U.S. Cl. 19—203 **6 Claims**



1. A cotton discharge mechanism for a cotton harvester in which cotton is discharged in a stream of comingled mixture of ripe and green bolls, a vertical duct having a lower end adjacent to and opening downwardly to the stream and extending upwardly to a discharge end; a blower having an outlet opening into the duct spacedly above its lower end and directed toward the discharge end and effective to induce a secondary air stream into the lower portion of the duct beneath the outlet for drawing the ripened bolls from the comingled mixture; a rotary cotton cleaner wheel supported in the duct and composed of a drive shaft traversing the duct adjacent its lower end and a plurality of vertically disposed cleaner blades supported on the shaft and spaced axially therealong to provide vertical spacings therebetween through which the secondary air stream may pass, said blades having peripheral teeth thereon on which the ripened bolls impinge as they move upwardly in said secondary air stream; a grate structure alongside the wheel against which the ripe bolls are drawn for removing trash therefrom; means for removing the ripened bolls from the wheel and for discharging the ripened bolls into the duct above the wheel; and an adjustable air inlet in said duct below said rotary wheel and above said comingled mixture for affecting the intensity of said secondary stream.

3,881,227

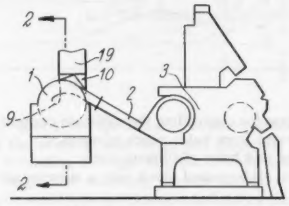
DEVICE FOR CLEANING FIBROUS MATERIALS

Ubai Arifovich Arifov, Observatorskaya ulitsa, 85; Dmitry Efimovich Kharmats, Bolshaya Mirabadskaya ulitsa, 119; Gafur Abdushukurovich Abdurashidov, Ts-13, dom 21, kv. 29; Alexandr Vasilievich Vzenkonsky, Ts-2 dom 6, kv. 16; Anatoly Dmitrievich Sapon, Ts-2, dom 15, kv. 25; Vladimir Fedorovich Lavnikanis, ulitsa Lenina, 16; Mark Isoifovich Kogan, ulitsa Botkina, 1, kv. 14; Nikolai Petrovich Egorov, ulitsa 7 topolie, 4; Jury Danilovich Gomelsky, Massiv Cherdantseva, 2, dom, 23, kv. 4, and Abuzar Gabdurakhmanovich Shaidullin, kvartal 6, dom 26, kv. 13, all of Tashkent, U.S.S.R.

Continuation of Ser. No. 275,961, July 28, 1973, abandoned. This application Oct. 11, 1973, Ser. No. 405,437

Int. Cl. D01b *1/00*

U.S. Cl. 19—205 **7 Claims**



1. A device for cleaning fibrous materials, comprising a horizontal cylindrical chamber with an air duct connected tangentially to said chamber for establishing a rotating air flow inside said chamber: a horizontal cylindrical waste separating chamber connected to said first cylindrical chamber; said separating chamber including in a lower portion bars grouped in sections and affixed with one end projecting into said waste separating chamber; plates with cylindrical surface disposed between said sections of bars; said bars and plates forming a bar grate constituting the lower portion of the waste separating chamber against which circulating material is beaten for extracting waste impurities; a compartment for collecting waste impurities and portions of partly fibrous material, said compartment being disposed beneath and communicating with said waste separating chamber; a second cylindrical chamber for receiving material passing over the bars for removing cleaned fibrous material, said second chamber extending axially inside said first cylindrical chamber and provided with a sleeve at one end thereof; the distal end of said sleeve being spaced from an end wall of said cylindrical waste separating chamber; said sleeve including means for providing axial displacement relative to the end wall for varying said distance to control the amount of material withdrawn and the degree of cleaning.

3,881,228

CLIP

Teruo Takabayashi, Kyoto, and Hiroyuki Fukushima, Tokyo, both of Japan, assignors to Kohshoh Limited, Kyoto City, Japan

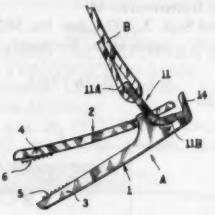
Filed Dec. 17, 1973, Ser. No. 425,309

Int. Cl. A44b *21/00*

U.S. Cl. 24—250 **7 Claims**

1. A clip comprising a first and a second plate members pivotally connected to each other and each provided with jaws at one end thereof for engagement with an article to be clipped, the first plate member having a pivotal element which is integrally provided and traversely overbridging on the inner surface of the first plate member, the second plate member having a receiving element integrally provided on the outer

surface of the second plate member so as to engage with the pivotal member, a closing member for retaining the plate



members in the closed position, and a spring biasing the jaws to the opened position.

3,881,229

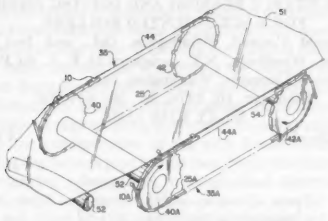
CHAIN MOUNTABLE GRIPPER

Philip L. Reid, Duncan, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed June 3, 1974, Ser. No. 475,322

Int. Cl. D06c *3/02*

U.S. Cl. 26—61 B **12 Claims**



1. A grippper for gripping an advancing web of sheet material between a jaw face of the gripper and a jaw face presented by a link in a chain including connected links and pins pivotally interconnecting adjacent links, at least selected ones of said pins each having a hole therethrough, said chain defining a cycling endless loop having at least two arcuate segments and a generally linear segment therebetween, said gripper comprising:

A. a generally U-shaped portion comprising first and second arms connected by a bridging member, said first arm being receivable in one of said holes, and

B. mounting means for substantially precluding rotation of said first arm relative to one of the two links directly interconnected by the pin receiving the arm when the first arm is so received and for permitting rotation of the first arm relative to the other of said two links when the first arm is so received, said second arm having a jaw face adapted to cooperate with the jaw of a link spaced from said arm-receiving pin to firmly and releasably grip a web therebetween when the first arm is so received and the generally linear segment includes said spaced link and said two directly interconnected links, said arm jaw being angularly displaceable away from the jaw of said spaced link to release the grip when said linear chain segment ceases to include said two directly interconnected links.

3,881,230

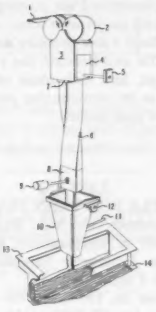
TOW PROCESSING APPARATUS

Harold Edward Arnold, Wilmington, N.C., and Joseph Boatner Herbert, Camden, S.C., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 13, 1973, Ser. No. 424,301

Int. Cl. D02g *1/20, 1/12*

U.S. Cl. 28—1.3 **1 Claim**



1. In a continuous tow processing apparatus including cooperating crimper rolls, a stuffer box associated with said rolls to crimp the tow and a four-sided helically twisted closed chute positioned below said stuffer box for changing the orientation of said tow, the improvement comprising: a biased first crimper gate positioned in said stuffer box for maintaining pressure on said tow in said stuffer box; an interface collar connecting said stuffer box and one end of said chute; and a biased second crimper gate incorporated into the other end of said chute the bias load on said second gate being the same as the first gate, whereby the crimped tow is supported under pressure while the orientation of said tow is being changed in said chute.

3,881,231

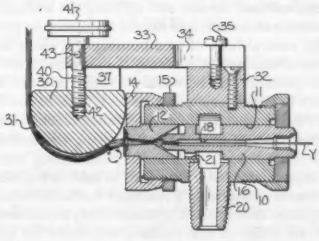
CYLINDRICAL BAFFLE FOR YARN TEXTURING AIR JET

Samuel T. Price, Kennedyville, Md., and Richard J. Polney, New Castle, Del., assignors to Enterprise Machine and Development Corporation, New Castle, Del.

Filed June 21, 1974, Ser. No. 481,555

Int. Cl. D02g *1/16*

U.S. Cl. 28—1.4 **6 Claims**



1. In a yarn texturing air jet of the type including an elongate housing having a central bore therethrough, an entrance end for passage of yarn into said air jet, an exit orifice for passage of yarn from said air jet, and means for directing pressurized air into the central bore of said housing to contact the yarn and pass outwardly through the exit end of said air jet to impart crimps, curls and loops to the filaments as the yarn passes through said air jet; the combination therewith of

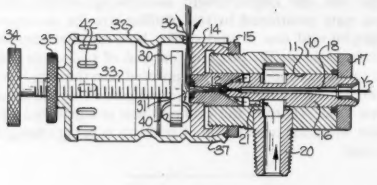
means for enhancing the crimps, curls and loops imparted to the yarn by said air jet, said means comprising a baffle, means for supporting said baffle on said air jet for both vertical and horizontal adjustment adjacent said exit orifice of said air jet for engaging the yarn extending therefrom, the lower portion of said baffle being cylindrical and having a solid surface of uniform radius for engaging and directing the yarn in a semicircular path downwardly from said exit orifice and beneath the lower portion of said baffle, said baffle being engaged by the yarn and the pressurized air passing outwardly through said exit orifice of said air jet with some of the pressurized air being deflected to form a low pressure area between said exit orifice and said baffle and beneath the yarn leaving said exit orifice of said air jet, and with some of the pressurized air following the yarn in its semicircular path of travel beneath the lower portion of said baffle.

3,881,232

RESONANT BAFFLE FOR YARN TEXTURING AIR JET

Samuel T. Price, Kennedyville, Md.; Richard J. Polney, New Castle, and Walter A. Hoffsommer, Ridley Park, both of Del., assignors to Enterprise Machine and Development Corporation, New Castle, Del.

Filed June 26, 1974, Ser. No. 483,239
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **7 Claims**



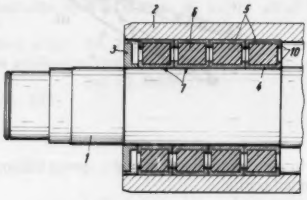
1. In a yarn texturing air jet of the type including an elongate housing having a central bore therethrough, a venturi supported in the central bore and in the exit end of said housing, said venturi defining the exit end of a turbulence chamber, a yarn guiding needle positioned in the central bore of said housing and having an inner end portion positioned closely adjacent said venturi and defining the entrance end of said turbulence chamber, and means for directing pressurized air into the central bore of said housing and along said inner end portion of said needle whereby the air passes through said turbulence chamber and outwardly through said exit orifice of said venturi to impart crimps, curls and loops to the filaments as the yarn passes through said turbulence chamber; the combination therewith of means for increasing the turbulence of air in said turbulence chamber and enhancing the crimps, curls and loops imparted to the yarn in said turbulence chamber, said means comprising a resonant baffle including a substantially planar face extending transversely across and spaced from said exit orifice of said venturi, and means for supporting said resonant baffle for axial adjustment toward and away from said exit orifice of said venturi to vary the spacing therefrom, said resonant baffle being solid and extending perpendicular to said central bore so that the pressurized air passing outwardly through said exit orifice of said venturi is engaged by said baffle to cause some of the energy of the pressurized air to echo back into said turbulence chamber and to thereby vary the normal resonance and increase the turbulence in said chamber.

3,881,233

ROLLER FOR HEAVILY LOADED ROLL TABLES AND RELATED METHOD

Ernest Schmidt; Helmut Licht, both of Bochum, and Willi Kasper, Wattenscheid, all of Germany, assignors to Fried, Krupp Huttenwerke AG

Filed Sept. 3, 1974, Ser. No. 502,397
Claims priority, application Germany, Sept. 1, 1973, 2344236
Int. Cl. B21b *13/02*
U.S. Cl. 29—110 **6 Claims**



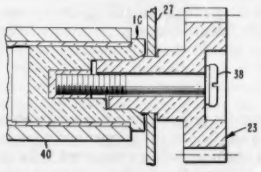
1. A roller for heavily loaded roll tables, such as rolling mill roller beds for blooms, said roller comprising a rotatable shaft, a shell of wear-resistant material connected with said rotatable shaft, concentric metal rings, moldings of resilient material arranged radially under prestress between said metal rings to form an arrangement between the shaft and the shell at least in two end regions of the shell, said rings being united firmly with the shell and the shaft respectively.

3,881,234

DEMOUNTABLE BEARING AND DRIVING MEMBER FOR RACK MOUNTED ROLLERS

John Arnold Crowell, Wilmington, Del., and Joel Leroy Vanover, Woodbury, N.J., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 10, 1974, Ser. No. 459,708
Int. Cl. B21b *13/02*
U.S. Cl. 29—115 **4 Claims**



1. In apparatus for transporting film having at least one demountable roller secured in a supporting frame the improvement which comprises:

a roll end socket on the end of said roller having an elongated recess along the axis therein, a collar at the end of said roll end socket circumscribing said recess and forming a thrust bearing surface for contacting the surface of said supporting frame, a first torque transfer means incorporated in said recess for transferring torque to said roller, and a securing means,

a unitary gudgeon having, a torque transmitting shaft rotatably and removably mounted in said supporting frame and removably insertable into the elongated recess of said roll end socket, said shaft having a bore along its axis, a second torque transfer means integral with the insertable end of said shaft for cooperating with and transferring torque to said first torque transfer means, a drive means mounted on the end of said shaft outside said supporting frame for providing torque to said shaft, a thrust bearing surface integrally affixed to said drive means between

said drive means and said supporting frame for making contact with said supporting frame, and

a fastening member extending through said bore in said shaft and fastenable into said securing means for fastening said gudgeon to said roll end socket.

3,881,235

STEPS, STAIRS AND THE LIKE, AND A METHOD OF CONSTRUCTING SAME

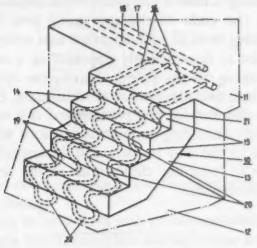
Sven Gunnar Svenstam, Upplands, Vasby, Sweden, assignor to Gränges Essem Aktiebolag

Filed Aug. 28, 1972, Ser. No. 284,456

Claims priority, application Sweden, Aug. 27, 1971, 10908/71

Int. Cl. F24h *3/00*

U.S. Cl. 29—157.3 R **8 Claims**



1. A method of making a flight of steps, stairs and the like having at least one pipe for carrying heating medium arranged beneath the treads of the steps to maintain the steps free from ice and snow, each pipe being mounted to the frame structure of the steps at least prior to forming the external tread surfaces of the steps, the method comprising the steps of twisting at least one permanently pre-shaped pipe having interconnecting and substantially arcuate portions about the longitudinal axis of said pipe at regions along the length thereof to conform said pipe to the configuration of the step frame structure, and mounting the twisted pipe to said step frame structure with the pipe extending substantially in longitudinal direction of the finished steps in planes located generally parallel with the treads and risers of said steps, said interconnected and substantially arcuate portions curving alternatively toward either side of the steps, said pipe extending substantially at right angles to the longitudinal direction of said flight of steps at the point where the pipe passes between respective treads and risers.

3,881,236

METHOD OF PROVIDING BALL ENDS ON GUITAR STRINGS

William H. Chaffee; Alfred M. Rubio, and Richard L. Lorenz, all of Chicago, Ill., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Division of Ser. No. 274,810, July 24, 1972, Pat. No. 3,777,613, which is a continuation-in-part of Ser. No. 160,734, July 8, 1971, abandoned. This application June 27, 1973, Ser. No. 373,950

Int. Cl. G10d *3/00*

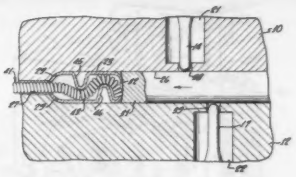
U.S. Cl. 29—169.5 **81 Claims**

1. A method of providing an enlarged end on a string for a musical instrument, which comprises:

disposing an end portion of a string for a musical instrument longitudinally within an elongated object;

applying lateral compressive forces externally to said object to deform the same in such manner as to effect bending of said string end portion; and

applying longitudinal compressive forces externally to said object while said object is confined within a forming chamber having a predetermined shape, said longitudinal compressive forces being of a magnitude sufficient to



deform said object into generally the shape of said forming chamber and to cause said object to seize the bent string end portion for prevention of withdrawal thereof.

3,881,237

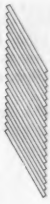
SQUARE CUT BIAS BELT OF STEEL TIRE CORD

Thomas A. Barnett, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1972, Ser. No. 319,278

Int. Cl. B21f *37/00*

U.S. Cl. 29—193 **1 Claim**



1. A bias belt comprising a plurality of steel wires, in essentially adjacent, parallel relationship wherein the planar area of each of the terminal ends of each wire is essentially equal to the minimum cross-sectional area of each wire.

3,881,238

APPARATUS FOR WINDING MAGNETIC CORES AND TREATING LEADS

Lowell M. Mason, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

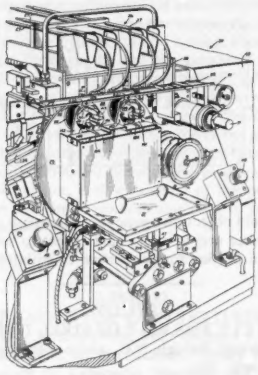
Division of Ser. No. 189,616, Oct. 15, 1971, Pat. No. 3,812,570. This application Nov. 14, 1973, Ser. No. 415,504

Int. Cl. H02k *15/00*

U.S. Cl. 29—205 D **5 Claims**

1. A coil winding machine comprising at least one winding gun assembly supported for rotational and longitudinal movement about a longitudinally extending axis thereof; means for supporting a magnetic core in the vicinity of the winding gun assembly so that at least one coil of wire is developed with at least one portion thereof adjacent to at least one preselected coil accommodating region of the core as the winding gun assembly undergoes rotational and longitudinal movement; lead wire handling means for pulling a predetermined length of wire from the at least one winding gun assembly; means for severing the length of wire; and means for holding a portion of the wire so severed between the severed part thereof and the winding gun assembly; said lead wire handling means including a lead wire pulling element mounted for movement generally toward and away from a line extending between the winding gun assembly and a core supported adjacent thereto by the means for supporting a magnetic core; said means for severing forming part of an assembled mechanism having a wire accommodating opening therein and supported for

movement toward a line extending between the lead wire pulling element and a winding gun assembly; said assembled



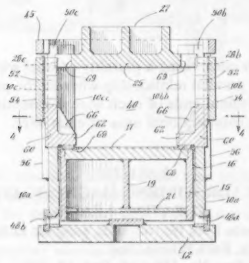
mechanism also including said means for holding a portion of the wire so severed.

3,881,239

METHOD OF FABRICATING HYDRAULIC PRESSES

Leland E. Coulter, New Canaan, Conn., and Herman S. Church, Cuyahoga Falls, Ohio, assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Jan. 28, 1974, Ser. No. 437,359
Int. Cl. B23p *17/00;* B30b *1/32*
U.S. Cl. 29—416 3 Claims



1. The method of fabricating enclosure parts for heavy duty presses from beginning stock comprising a rectangular steel plate having the length of one pair of parallel edges greater than the desired length of one finished enclosure part but shorter than the combined length of two such parts and having the length of the orthogonal edges substantially equal to the desired internal circumference of the finished enclosure, with method comprises

A. forming the steel plate into a hollow cylinder in which the said orthogonal edges define the ends of the cylinder and in which the first-mentioned pair of edges are in abutting contact;

B. welding the abutting edges to complete the continuity of the inner and outer surfaces of the hollow cylinder;

C. in a region of the cylinder between its ends cutting four identically dimensioned longitudinally extending separation slots which

1. are 90° displaced from one another about the circumference of the cylinder and

2. terminate at each end at a distance from the corresponding end of the cylinder which is the same for each of the slots and is also the same for each end of the individual slots, whereby identical uncut annular bands are left at each end of the cylinder;

D. at one end of the slotted region

1. cutting a first circumferential separation slot in the cylinder between the corresponding ends of two adjacent longitudinal slots and

2. cutting a second circumferential separation slot between the other two longitudinal slots in such location that every point along the second slot is diametrically opposed to a corresponding point along the first slot;

E. at the other end of the slotted region

1. cutting a third circumferential separation slot in the cylinder between the ends of two adjacent longitudinally extending slots in such a location that every point along the third slot is 90° circumferentially displaced from a corresponding point along each of the two previously mentioned circumferential slots, and finally

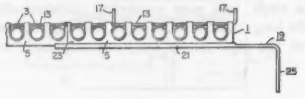
2. cutting a fourth circumferential separation slot between the ends of the remaining two longitudinally extending slots in such location that every point along this slot is diametrically opposed to a corresponding point along the third slot, whereby the cylinder is separated into two identical enclosure parts, each comprising a solid annular end portion and two opposed longitudinally extending segmental portions which are connected to the end portion and separated by openings similar in form and dimensions to the segmental portions themselves.

3,881,240

METHOD FOR INSTALLING A TUBE CLAMP

Charles C. Peake, and Harry H. Bolan, both of Media, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 306,132, Nov. 13, 1972, Pat. No. 3,813,749. This application Nov. 12, 1973, Ser. No. 415,281
Int. Cl. B23q *3/00*
U.S. Cl. 29—468 2 Claims



1. A method for installing a tube clamp formed from an elongated strip having generally parallel side margins and a plurality of transversely disposed elongated openings disposed therein to form kerfs when the strip is bent generally parallel to its longitudinal axis utilizing a straight pin and a tool formed from a flat bar which has its edges folded at an angle in excess of 90°, said method comprising the steps of:

compressing the margins of the strip to fit within the folded edges of the tool,

placing the kerfs over the tubes,

inserting the straight pin between the tubes and the bent portion of the strip to capture the tubes within the kerfs, and

sliding the tool from the strip, whereby the margins of the strip spring outwardly tightly clamping the tubes against the pin.

3,881,241
GALVANO-MAGNETO EFFECT DEVICE

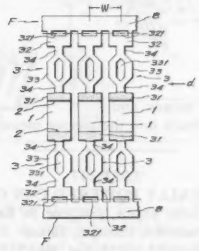
Noboru Masuda, Saitama, and Hisashi Takiguchi, Tokyo, both of Japan, assignors to Denki Onkyo Company, Ltd., Tokyo, Japan

Division of Ser. No. 183,007, Sept. 23, 1971, abandoned. This application July 21, 1972, Ser. No. 274,060

Claims priority, application Japan, Sept. 28, 1970, 45-84799

Int. Cl. B01j *17/00*

U.S. Cl. 29—574 **5 Claims**



1. A method of connecting a lead frame to a semiconductor element comprising:

a. positioning in parallel a pair of unconnected lead frame plates, each lead frame plate having a base and a plurality of lead frames extending therefrom forming a comb type structure, wherein said positioning includes positioning said bases in parallel with said lead frame extending towards each other, the extended ends of each said lead frame on one of said lead frame plates being positioned at a predetermined distance from the corresponding lead frame on the other of said lead frame plates;

b. providing a plurality of magneto-resistance effect elements with each element having at least a pair of electrodes, placing each magneto-resistance element between the extended ends of a pair of opposed lead frames of said pair of lead frame plates with each electrode of said pair of electrodes of each element contacting a different one of said pair of opposed lead frames; and

c. heating the extended ends of said lead frames to bond said extended ends to the electrodes of said pair of electrodes of said magneto-resistance elements.

3,881,242
METHODS OF MANUFACTURING SEMICONDUCTOR DEVICES

Roy Nuttall, Cheadle, and Leslie Dormer, Poynton, both of England, assignors to Ferranti Limited, Hollinwood, Lancashire, England

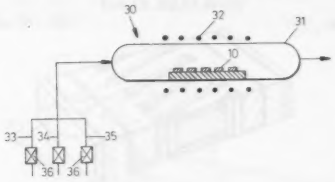
Filed Nov. 8, 1973, Ser. No. 413,894

Claims priority, application United Kingdom, Nov. 8, 1972, 51566

Int. Cl. B01j *17/00*

U.S. Cl. 29—589 **16 Claims**

1. A method of manufacturing a semiconductor device, the device having a monocrystalline silicon semiconductor body, a passivating layer of silicon oxide on at least one surface of the semiconductor body defining an aperture through which a part of said surface of the semiconductor body is exposed, and an ohmic contact extending both to the part of said surface of the semiconductor body exposed through the aperture in the passivating layer and on portions of the passivating layer adjacent to the aperture, the method including forming the ohmic contact by depositing a layer of polycrystalline silicon and a layer of metal selected from the group tungsten and molybdenum, the polycrystalline layer and the metal layer are deposited consecutively within the same deposition apparatus, the polycrystalline layer is deposited from an atmosphere of silane maintained at a temperature in the range 700° to 750°C within the deposition apparatus, when the metal layer is to be deposited the atmosphere is modified by the introduction



therein of a vapour of a compound of the metal, the modified atmosphere being maintained at a temperature in the same range, and the metal layer being deposited from the modified atmosphere by the reduction of the compound by the silane.

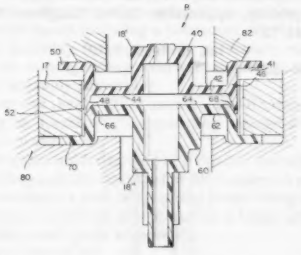
3,881,243
METHOD OF MAKING PERMANENT MAGNET ROTOR FOR A SYNCHRONOUS MOTOR

Albert C. Bannon, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 342,072, March 16, 1973. This application Dec. 10, 1973, Ser. No. 423,183

Int. Cl. H02k *15/04*

U.S. Cl. 29—598 **3 Claims**



1. A method of forming a permanent magnet rotor comprising:

a. providing a hub of at least two sections,

b. positioning a permanent magnet having at least one recess therein between said sections at their outer peripheries, and

c. applying an ultrasonic vibration to at least one of said sections to bond said sections together at their outer peripheries, at least a portion of said sections being melted and flowing into at least said recess whereby said permanent magnet is secured in place.

3,881,244
METHOD OF MAKING A SOLID STATE INDUCTOR

Don Leslie Kendall, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 259,325, June 2, 1972, abandoned. This application Aug. 3, 1973, Ser. No. 385,625

Int. Cl. H01f *7/06*

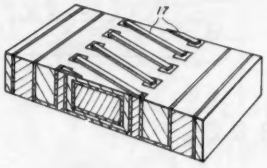
U.S. Cl. 29—602 **5 Claims**

1. The method of forming a semiconductor inductor from a semiconductor body having first and second surfaces comprising the steps of:

a. forming a plurality of selectively spaced parallel grooves in said first surface to provide at least first and second rows of semicondutor material between said grooves,

b. selectively removing portions of siad first and second rows to provide studs in said first and second rows,

c. depositing a core material of one permeability between said first and second rows of semiconductor studs,



d. lapping said lower surface to remove said semiconductor body between said second surface and said grooves, and

e. selectively electrically interconnecting said semiconductor studs in a helix configuration circumventing said core material.

3,881,245

MOUNTING ELECTRICAL COMPONENTS ON THICK FILM PRINTED CIRCUIT ELEMENTS

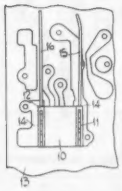
Jeffrey Leoman Dudley, Solihull, and John Christopher Walker, Nuneaton, both of England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed Feb. 26, 1974, Ser. No. 445,853

Claims priority, application United Kingdom, Mar. 13, 1973, 12041/73

Int. Cl. H05k *3/32*

U.S. Cl. 29—627 **9 Claims**



1. A method of mounting, on thick film printed circuit elements, components having metallised contact areas, comprising welding a strip of metal foil to a conductive area of the circuit element, placing the component so that a metallised area of said component overlays the welded portion of said strip, wrapping the ends of the strip around the component and welding them to said metallised area on the component.

3,881,246

METHOD AND APPARATUS FOR FACILITATING THE POSITIONING OF THE FREE END SECTIONS OF A PLURALITY OF LEADS IN A PLURALITY OF GROOVES

Kenneth Foster Folk, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 12, 1973, Ser. No. 424,132

Int. Cl. H01r *43/00*

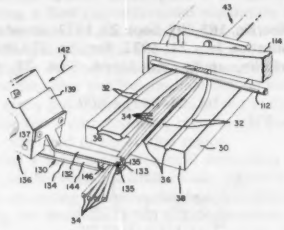
U.S. Cl. 29—628 **21 Claims**

1. A method of positioning leads having free ends comprising the steps of:

providing an apparatus including a template having groove means;

holding a portion of a plurality of leads remote from the free ends of the leads adjacent one end of said groove means;

moving the free ends of the leads away from said one end



of the groove means; and

positioning the leads into the groove means.

3,881,247

ELECTRICALLY POWERED CAN OPENER

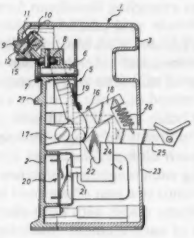
Tatuo Niwa, Mie-ken, Japan, assignor to Kabushiki Kaisha Aichi Denki Kosakusho, Kasugai, Japan

Filed June 22, 1973, Ser. No. 372,778

Claims priority, application Japan, Sept. 8, 1972, 47-104898[U]

Int. Cl. B67b *7/34*

U.S. Cl. 30—4 R **5 Claims**



1. In an electrically powered can opener of the type adapted to sever the outer layer of an end seam of a can and including a body frame, an electric motor housed within said body frame, a drive shaft driven by said motor horizontally journalled on and protruding from the vertical front member of said frame, a can rim drive cog wheel mounted on the protruding portion of said shaft to rotate a can by driving the lower edge of the outer layer of the can end seam, a cutting wheel rotatably mounted on said front member and positioned so that the cutting edge thereof may be engaged with the outer layer of the end seam of a can, a lever mechanism mounted on said frame to activate said motor, and a cam rim engaging roller mounted on said lever mechanism in such a manner that the engaging portion of said roller may be brought inside the inner layer of the end seam of a can to depress the seam toward the cutting edge of said cutting wheel upon operating said lever mechanism; the improvement wherein said lever mechanism comprises an actuating lever pivoted for vertical movement to said body frame for activating said motor when lowered, an operation lever pivoted at one end co-axially with said actuating lever, a rotary plate having said can rim engaging roller mounted thereon and journalled at one end and having its other end pivotally connected by a link to a portion of said operation lever, and a resilient means connected between the other end of said operation lever and a portion of said actuating lever for normally biasing said actuating and operating levers toward each other, whereby said resilient means is stretched by a predetermined amount while said

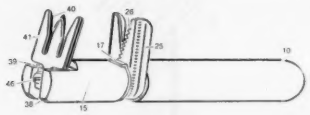
roller depresses the inner layer of a can end seam and is further stretched when said cutting wheel severs a thicker portion of the outer layer of a can end seam.

3,881,248

WIRE CUT AND STRIP TOOLS

Harry Kaufman, New Rochelle, N.Y., assignor to O.K. Machine and Tool Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 366,123
Int. Cl. H02g 1/12
U.S. Cl. 30—90.1 **16 Claims**



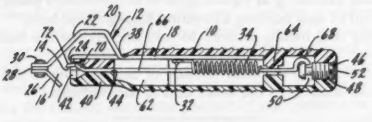
1. A hand tool for stripping insulation from an electrical wire, comprising a generally plate-like member having a groove extending inwardly from one edge of the member, said groove being defined by side walls of the member having a thickness direction generally perpendicular to the plane of the plate-like member, first side wall portions on opposite sides of one groove portion being parallel to one another and spaced apart by a distance substantially equal to the diameter of the metal part of the electrical wire to form a stripping slot capable of slicing through the insulation when the wire is forced down into the groove, second wall portions on opposite sides of said one groove portion and adjacent in the thickness direction said first side wall portions and being substantially parallel to one another and forming a centering slot aligned in the thickness direction with the stripping slot and having lateral dimensions such as to receive the insulated electrical wire and center and guide the metal part of the electrical wire as it passes through the stripping slot when the wire is pulled through the groove to strip the sliced insulation from one end of the wire.

3,881,249

CABLE STRIPPER

John A. Cox, Jr., Genoa, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed June 5, 1974, Ser. No. 476,511
Int. Cl. H02g 1/12
U.S. Cl. 30—90.7 **7 Claims**



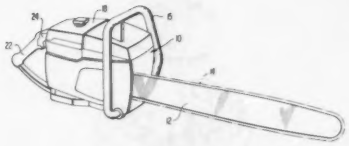
1. In a tool for stripping the insulation from cable and the like, an elongated handle with a generally circular cable-receiving zone on one end thereof, a frame overlying and defining a part of the cable-receiving zone with the handle and frame being spring-biased toward each other so that a cable in the cable-receiving zone will be firmly held against the end of the handle, and a cutting edge adjustably mounted in the cable-receiving zone with the cutting edge being free to rotate about a pivotal axis extending longitudinally through the handle and said cutting edge being along a line disposed at an angle that intersects the pivotal axis.

3,881,250

CHAIN SAW FILTER ASSEMBLY

Robert Eugene Frederickson, Southgate, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Nov. 8, 1972, Ser. No. 304,592
Int. Cl. B23d 49/00
U.S. Cl. 30—383 **6 Claims**



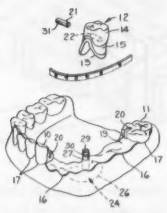
1. A chain saw comprising:
a metallic housing;
a guide bar connected to said housing;
a cutting chain carried by said guide bar;
an internal combustion engine carried by said housing and including a carburetor;
air passage means communicating with said carburetor;
a stationary retainer plate attached to said housing and located in said air passage means;
a vented metallic cover removably disposed over said air passage means;
said cover and said retainer plate including fastener means for releasably attaching said cover to said housing, said fastener means including a connector pin;
a filter assembly for segregating particulate matter from inlet air passing through said inlet air passage means, said filter assembly comprising:
at least one sheet of filter material, said filter sheet including an aperture accommodating passage of said connector pin, and
a one-piece holder formed of a flexible material for supporting said flexible sheet of filter material, said holder comprising a pair of apertured plates integrally joined along a common side to define a hinge axis for said plates, each plate comprising:
a peripheral rim,
a network of criss-crossing ribs defining a plurality of apertures including an aperture receiving said connector pin,
first resilient sealing ridge means projecting from both sides of said rim and extending substantially continuously around said rim, and
second resilient sealing ridge means projecting from both sides of the portion of said rib network defining said pin-receiving aperture to surround the latter;
said holder being foldable along said hinge axis to orient said plates in superposed relationship with said sheet of filter material sandwiched between said plates and engaged by internally located ones of said first and second sealing ridge means, with the apertures of said plates being in general alignment; and
seating ledge means on said housing for receiving said filter assembly;
said cover including pressure surface means engageable with externally located ones of said first and second sealing ridge means of one plate for urging internally located ones of said first and second sealing ridge means against opposite sides of said filter sheet, and urging externally located ones of said first and second sealing ridge means of the other plate against said seating ledge means, so as to impose an air seal around the periphery of said filter assembly and around said pin-receiving aperture when said cover is secured to said housing by said fastener means.

3,881,251

CROWN AND BRIDGE PREFABRICATED SYSTEM

Maurice Valen, Franklin Dental Studios, 40-17 83nd St., Jackson Heights, N.Y. 11373

Filed Jan. 2, 1974, Ser. No. 430,170
Int. Cl. A61c *13/22*
U.S. Cl. 32—5 **7 Claims**



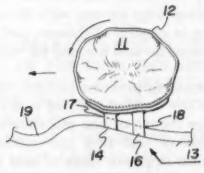
1. An artificial tooth structure for placement in a mouth of an individual, in that portion thereof, requiring replacement of at least one missing natural tooth, said artificial tooth structure being an operatively viable, and simulative replacement for the natural missing teeth, each of the artificial teeth of said structure comprising a composite of two mutually bonded members, a first member of said composite being a crown section having the shape and color simulative of the missing natural tooth crown, a second member of said composite being bonded to a lower portion of said crown section and simulative in shape and color of a gum section immediately adjacent said missing natural tooth crown, which said gum section being a resorbed portion of the gum, said second gum-like member acting to replace said resorbed gum section so as to act as a natural base for said crown member, and also being flexible so as to act as a load carrying cushion between the resorbed gum and said crown section for adjusting for masticatory forces exerted upon said crown member during mastication, thus providing a natural functional viability to said artificial tooth structure, said composite tooth structure containing a slot-like aperture in a lower portion thereof, for receiving a bridge-like bar therein, and means supported by said composite to anchor the composite artificial tooth structure to said bridge-like bar, and further wherein said slot-like aperture receives a portion of an implanted structure which is anchored in said mouth.

3,881,252

ORTHODONTIC BRACKET EXTRACTION

Lawrence F. Andrews, 2025 Chatsworth Blvd., San Diego, Calif. 92107

Continuation-in-part of Ser. No. 249,684, May 1, 1972, abandoned. This application July 31, 1973, Ser. No. 384,196
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **3 Claims**



1. An orthodontic bracket for bodily tooth movement cases comprising:

a bracket having a groove recess therein for the reception of an archwire, said bracket having a leading edge and a trailing edge relative to bodily tooth movement; and

said leading edge being narrower than said trailing edge creating an angle between an installed archwire and a transverse axis of the tooth, said angle being substantially equal in degrees to the desired number of millimeters of tooth movement.

3,881,253

INSTA-PLOTTER APPARATUS FOR PLOTTING VISUAL AIRCRAFT POSITION USING RADIO INFORMATION

Robert E. Haws, 714 Placer Dr., Woodland, Calif. 95695

Filed Feb. 19, 1974, Ser. No. 443,686
Int. Cl. B43l *7/00*
U.S. Cl. 33—1 MP **4 Claims**

1. In an inflight plotting apparatus including a plotting board structure carrying a removable navigational map, a plotting device comprising:

a transparent flat circular plastic compass rose having a central opening;

a flat elongated transparent plastic rectangular first member having one end integral with a portion of the periphery of said rose, said rose and said first member lying in a common plane, said first member having a longitudinal slot extending from a position adjacent the other end of said first member to said one end of the first member, said first member having a linear scale disposed along the slot;

a transparent flat doughnut shaped second member secured to the top surface of the rose, said second member having an opening aligned with the central opening of said rose; a transparent cap secured to the top surface of the second member and having a central hole centered on the aligned openings;

a bushing disposed at the center of the openings and hole and extending at right angles to said common plane, one end of said bushing extending through said hole;

lifting ring means secured to said one end of the bushing; and

a suction cup disposed outside of the opening in the rose and secured to the other end of the bushing.

3,881,254

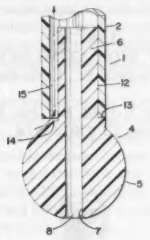
SALIVA EJECTOR

Louis C. Epstein, 3813 Westwood Rd., University Heights, Ohio 44118

Filed Feb. 6, 1974, Ser. No. 440,074
Int. Cl. A61c *17/04*
U.S. Cl. 32—33 **13 Claims**

1. A saliva ejector of the character described, comprising a suction tube, an ejector head comprising a spherical portion and a stem extending radially from said spherical portion and frictionally secured within one end of said suction tube, said head having a single suction passageay extending completely diametrically through said spherical portion and axially

through said stem, with the axis of said passageway coaxial with said suction tube, and means for aspirating a minimal



amount of atmospheric air into the space between said stem and the inner wall of said suction tube.

3,881,255

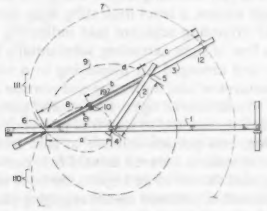
INSTRUMENT FOR INSCRIBING GEOMETRICAL LOOPS

Henry R. Pantek, 8717 Fallen Oak Dr., Bethesda, Md. 20034

Filed Apr. 5, 1974, Ser. No. 458,436

Int. Cl. B43l *9/00*

U.S. Cl. 33—27 R **9 Claims**



1. An instrument for inscribing on a surface a closed symmetrical planar loop having an inwardly directed cusp, said instrument comprising an axis arm member, a radius arm member, and an inscribing arm member joined to each other in a spaced relationship by three pivots, the first pivot joining the radially inner end portion of said radius arm member with the central portion of said axis arm member, the second pivot joining the radially outer end portion of said radius arm member and the central portion of said inscribing arm member by means permitting the distance between the first pivot and the second pivot to be adjustable, the third pivot joining one end portion of the axis arm member with one end of the inscribing arm member by means permitting the pivot to be adjustable with respect to the distance from it to each of the other two pivots, said inscribing arm member carrying two scribe means for inscribing said loop adjustable to locations along the length of said inscribing arm member, one of said scribe means being located between the second and third pivots and the other of said scribe means being located at the other end portion of the inscribing arm member, and said axis arm member having means for fixing its position with respect to the surface on which said loop is to be inscribed.

3,881,256

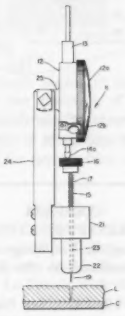
THICKNESS GAGE

Jack Jewell, Springfield, Ohio; Virgil D. Ferguson, McGregor, and Sherald J. Anderson, Waco, both of Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 21, 1974, Ser. No. 444,577

Int. Cl. G01b *5/06*

U.S. Cl. 33—172 R **1 Claim**



1. A thickness gage for measuring the thickness of an elastomeric liner, said liner being located in an enclosed casing comprising:

a. a base;

b. a zero dial indicator operably connected to the upper end of said base, said zero dial indicator having a spindle downwardly depending therefrom;

c. a pin assembly operably connected to the lower end of said base;

d. said pin assembly including a pin, a pin guide, a pin guide yoke, a spring and a head;

e. said pin having a pin point formed at the lower end and said head being attached to the upper end thereof, said head being in contact with said spindle;

f. said spring surrounding the upper region of said pin and positioned between said head and said pin guide yoke;

g. said pin guide surrounding the lower region of said pin and said pin guide yoke surrounding the middle region of said pin; and

h. the upper part of said pin guide being operably connected to the lower region of said pin guide yoke and said pin guide yoke being connected to lower end of said base.

3,881,257

LEVELLING DEVICE INCLUDING MERCHANDISE DISPENSING MEANS

Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

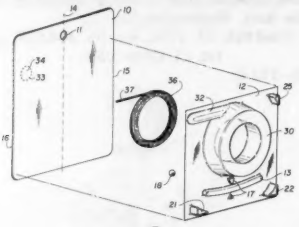
Filed July 16, 1974, Ser. No. 489,052

Int. Cl. G01c *9/10*

U.S. Cl. 33—354 **17 Claims**

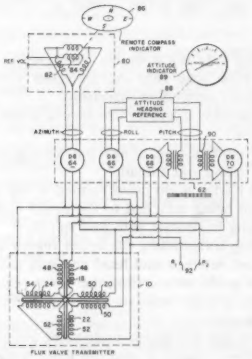
1. A levelling device comprising a flat backing sheet, a transparent layer affixed to said backing sheet, said transparent layer having a portion thereof formed to extend from the surface of said backing sheet to form a cavity having an arcuate side between said layer and said sheet, said cavity having an axis normal to the plane of said sheet, said device further having recesses formed by a portion of said layer extending from the surface of said sheet to define two surfaces of one plane which is normal to the surface of said sheet, an indicator member having a rolling surface and being movably located in

said cavity, and means on said device for indicating a centrally located annular position of said indicator member on said arcuate side of said cavity, whereby alignment of an object is



indicated by displacement of said indicator member to said angular position when said sheet is vertically held with said formed portion means held against said object.

3,881,258
ALL ATTITUDE COMPASS
Lloyd A. Iddings, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 10, 1973, Ser. No. 423,625
Int. Cl. G01c *17/30*
U.S. Cl. 33—357 **21 Claims**



1. An all-attitude magnetic compass and detector system compensated for magnetic variation, deviation, and dip comprising:

a flux valve transmitter having a four pole spool wherein said poles are spherically equiangularly spaced radiating from a common center;

an electromagnetic coil wound about each of said poles;

an azimuth differential synchro generator connected to said flux valve transmitter and deriving signals therefrom:

a remote compass indicator connected to said azimuth differential synchro generator;

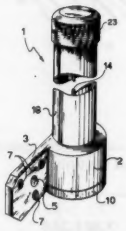
a roll differential synchro generator connected to said flux valve transmitter and providing roll compensating signals thereto;

an attitude heading reference for providing signals representing roll and pitch information; and

a pair of pitch differential synchro generators connected between said attitude heading reference and said flux valve transmitter and providing pitch compensating signals thereto;

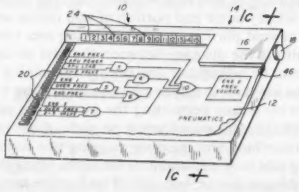
whereby said remote compass indicator displays accurate magnetic azimuth free of northerly and southerly turning errors and acceleration and deceleration errors.

3,881,259
LEVEL INDICATING DEVICE
Gérard Pigeon, 271 Quintal St., Laval-Des-Rapides, Quebec, Canada
Filed Aug. 7, 1973, Ser. No. 386,344
Int. Cl. G01c *9/14*
U.S. Cl. 33—397 **7 Claims**



1. A level indicating device comprising a base consisting of a first part and of a second part, a universal pivot means carried by said second part of said base and defining a universal pivot center, a needle member having a pivot portion and an indicating end portion, said pivot portion resting onto said universal pivot means with the center of gravity of said needle member operatively standing below the pivot center of said universal pivot means, a level indicating sight carried by said first part and extending adjacent said indicating end portion and having a line of sight extending substantially through said pivot center and arranged for displaying to a viewer to said sight all departures of said indicating end portion in any direction relative to said line of sight, said second part being laterally and adjustably secured to said first part for adjustment of said indicating, end portion relative to said level indicating sight, a plate extension secured to said first part of said base for attaching said device to an object, the level of which is to be monitored, and adjustment means engaging plate extension and constructed and arranged to produce levelling of said plate extension relative to said object.

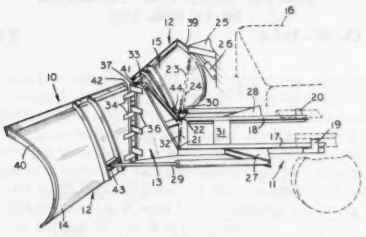
3,881,260
SELF-TEACHING MACHINE FOR BINARY LOGIC
James M. Hombs, 3241 S. 93 East Ave., Tulsa, Okla. 74145
Filed July 5, 1973, Ser. No. 376,315
Int. Cl. G09b *23/18*
U.S. Cl. 35—30 **14 Claims**



1. An independent machine for teaching binary logic utilizing a printed problem sheet having a plurality of illustrated logic gates, input and output signal paths printed thereon, said machine comprising:

a. a plurality of programmable universal gates (PUG), each PUG having at least two input terminals and one output terminal,
b. annunciator means for at least one of said PUG,
c. a plurality of manually operated situation selector switches to provide logic signals to the said PUGS,
d. a means to position said problem sheet to match a plurality of said situation selector switches with said plurality of illustrated logic input signal paths printed on said problem sheet
e. a programmable sensor means to selectively interconnect the output terminal of at least one said PUG to at least one input terminal of any second PUG and
f. said programmable sensor means comprising switching means carried by the machine and operably connected to the terminals of the PUG, operator means for said switching means carried by the said problem sheet and engagable with said switching means.

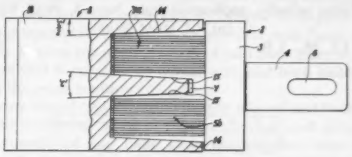
3,881,261
SMALL VEHICLE SNOW PLOW
Rene L. Lavoie, Box 135, Danville Junction, Maine
Filed June 4, 1973, Ser. No. 366,774
Int. Cl. E01h *5/04*
U.S. Cl. 37—46 **4 Claims**



1. In a snow plow having a support frame, including means to attach said frame to a selected vehicle, a first plow blade, a second plow blade substantially similar to said first plow blade, means on said frame to selectively extend or retract each said plow blade, and a pyramidal open brace means on said frame, said brace means tapering from said frame to a vertical apex, means to hinge the said first and second plow blade along the vertical length of the apex of said brace means, said means to hinge comprising a plurality of hinges on said first plow blade, a plurality of hinges on said second plow blade, a plurality of brace hinges on said brace means, said first plow blade and second plow blade and brace support hinges all engaging a single hinge pin forward of said apex said brace means and blades and hinges all supported by said support frame.

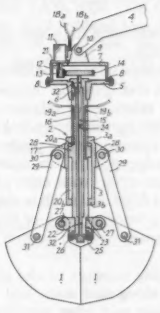
3,881,262
TWO-PART EXCAVATING TOOL
Clifford Cullen, Doncaster, Victoria, Australia, assignor to Vickers Ruwolt Proprietary Limited, Richmond, Victoria, Australia
Continuation of Ser. No. 70,396, Sept. 8, 1970, abandoned. This application July 11, 1973, Ser. No. 378,147
Claims priority, application Australia, Sept. 9, 1969, 60633/69
Int. Cl. E02f *9/28*
U.S. Cl. 37—142 R **16 Claims**

1. An excavator tool part adapted for weding engagement with another tool and having a motor external load bearing surface and a socket including locking side surfaces which extend transverse to said major load bearing surface, said locking side surfaces facing in opposite directions, being non-parallel in the direction of engagement with said another tool part and being curved in opposite directions in transverse cross-section, at least at their edges, and non-locking socket side surfaces extending transverse to said locking surfaces,



said non-locking surfaces facing in opposite directions and being non-parallel in the direction of engagement with said another tool part, and the included angle between said non-locking surfaces is greater than the included angle between said locking surfaces.

3,881,263
ANGULAR POSITION CONTROLLER FOR CLAM-SHELL BUCKET
Yves G. Coeurderoy, Lagny-le-Sec, France, assignor to Societe Anonyme: Poclain, Le Plessis Belleville, France
Filed Mar. 11, 1974, Ser. No. 449,609
Claims priority, application France, Apr. 18, 1973, 73.14238
Int. Cl. B66c *3/16;* **E02f** *3/44*
U.S. Cl. 37—186 **10 Claims**



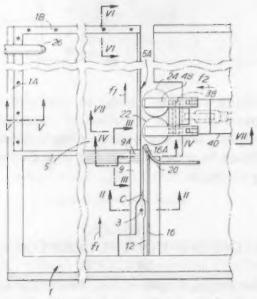
1. A clam-shell bucket comprising
grasping elements,
ram means for adjusting the position of said elements, said ram means comprising,
a cylinder having opposed end walls,
piston means slidable in the cylinder, and
piston rod means carried by the piston means, said piston rod means including a central cavity open at at least one end of the piston rod means,
motor means operative to adjust the angular orientation of the grasping elements, said motor means comprising,
a body member, and
a shaft member rotatable relative to the body member, and rotary driving rod means, one of said members being rigid with an end portion of the piston rod means, and the other of said members being coupled with the driving rod means, said driving rod means extending into the said cavity through the open end thereof.

3,881,264

DEVICE FOR FLATTENING AND IRONING THE SEAM ZONE BETWEEN TWO LAYERS OF FABRIC

Affortunato Grazzini, Arezzo, Italy, assignor to Cassina & Co. S.R.L.

Filed Oct. 17, 1973, Ser. No. 407,039
Claims priority, application Italy, Nov. 2, 1972, 9733/72
Int. Cl. D06f *69/00*
U.S. Cl. 38—1 B **7 Claims**



1. A seam flattener apparatus for directing a pair of fabric layers past an ironing station and for ironing portions of said fabric layers, said fabric layers each including

a longitudinally extending outer edge,

a sewn seam extending generally parallel to said edges of said fabric layers and defining on each of said fabric layers

an edge portion extending between said seam and said outer edge, and

a main portion extending on a side of said seam opposite said edge portion,

said apparatus comprising, in combination,

first guide means configured to dispose said main portions in a coplanar relationship relative to each other, with each of said main portions extending away from said seam in opposite directions, second guide means configured to dispose said edge portions in a coplanar relationship relative to each other, with each of said edge portions extending away from said seam in opposite directions and with the edge portion of each of said fabric layers overlapping the respective main portion of its corresponding fabric layer,

means for supplying moisture to said edge portions and said main portions along said seam, and

means for pressing said edge portions against said main portions along said seam while simultaneously applying heat thereto, said pressing means being located relative to said first and second guide means to press and apply heat thereto after said main portions and said edge portions have been disposed in said coplanar relationships.

3,881,265

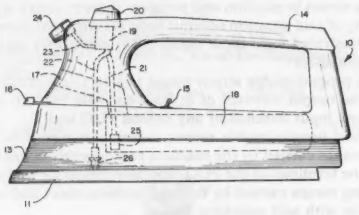
STEAM-SPRAY IRON

John L. Eaton, Delanco, N.J.; John C. Fagan, Philadelphia, and Roger V. Eeckhout, Warminster, both of Pa., assignors to SCM Corporation, New York, N.Y.

Filed May 25, 1973, Ser. No. 363,965
Int. Cl. D06f *75/06*
U.S. Cl. 38—77.5 **23 Claims**

1. In an electrical pressing iron having a sole plate with steam ports, a steam generating chamber communicating with said steam ports, a spray nozzle, a valve means with two outlets, one communicating with said spray nozzle and the other with said steam generating chamber, a reservoir, a pump having piston means, said pump having an inlet communicating with said reservoir and an outlet communicating with said valve, the improvement comprising:

said valve means being bistable for allowing only one of said two outlets to be open at a time, and



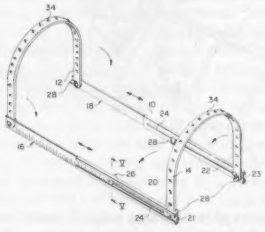
pump actuation means for operating said pump and for selecting said one of said valve's stable states.

3,881,266

PORTABLE AND COLLAPSIBLE NEEDLEWORK FRAME

Maureen Finebloom, Garnerville, N.Y., assignor to Peska Associates, Inc., New York, N.Y., a part interest

Filed May 13, 1974, Ser. No. 469,284
Int. Cl. D06c *3/08*
U.S. Cl. 38—102.4 **5 Claims**



1. Needlework apparatus comprising, in combination, a frame adapted to rest on the lap of a user while said frame is in use, said frame including a pair of longitudinally adjustable horizontal members; a pair of semi-circular hoops adapted to fit over the arms of the user; pivot means for securing said semi-circular hoops to and within said horizontal members whereby said semi-circular hoops can be folded between said horizontal members, and needlework holding means on the outer periphery of said semi-circular hoops.

3,881,267

SHOPPING CART LIST HOLDER

Margie Hicks, 27 Marion St., Trenton, N.J. 08618

Filed Mar. 25, 1974, Ser. No. 454,676
Int. Cl. G09t *7/02*
U.S. Cl. 40—308 **1 Claim**

1. A shopping cart list holder device intended for detachable attachment to a handle of a conventional standard shopping cart for holding a shopping list conveniently thereon in a hand-free manner, the holder device comprising, in combination:

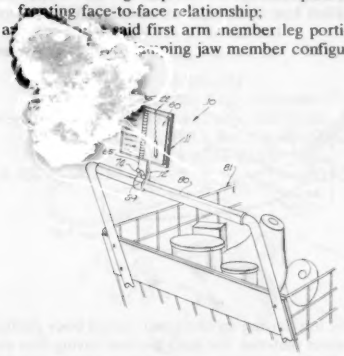
a first integrally formed arm member having a flat elongated longitudinally extending leg portion terminating at one end in an integrally formed curved semi-circular portion defining a clamping jaw member, the leg portion having a front surface and a back surface;

a second integrally formed arm member of a length substantially equal to said first arm member and having a leg portion terminating at one end in a curved semi-circular portion defining a clamping jaw member, the leg portion

including a base member bent at an angle to the axis of the leg portion and forming the end thereof opposite said clamping jaw member, the base portion having a front surface and a back surface;

means affixing said back surface of said second arm base member to said back surface of said first arm member at their respective ends opposed from said clamping jaw members with said second arm projecting downwardly behind said first arm and at an angle rearwardly thereof relative to said first arm with each of said clamping jaw members being disposed in normal spaced apart confronting face-to-face relationship;

an aperture in said first arm member leg portion adjacent said C-shaped clamping jaw member configuration;



an aperture in said second arm leg portion adjacent said C-shaped clamping jaw member configuration and in general axial alignment with said first arm aperture;

an elongated bolt having a threaded shank extending axially through said aligned apertures of said first and said second arm members with the head of said bolt engaging the front surface of said second arm member and with the threaded portion of said bolt projecting outwardly of the front surface of said first arm member;

a wing nut threadedly received on said bolt and operable thereon to move said arm members toward and away from each other in a clamping and unclamping manner of said clamping jaw members, this depending upon the direction of rotation of said wing nut relative to said bolt shank;

said first and second arm members defining a bracket member with said clamping jaw members thereof adapted to be removably affixed to the handle of the shopping cart with the opposite ends of the leg portion projecting outwardly from the shopping cart handle in a direction normal to the axis of the shopping cart handle;

a pair of substantially flat front plate and back plate members disposed in side-by-side relationship, said front plate member of approximately the same size and configuration as said back plate member;

said back plate member having a flat front surface, a flat back surface opposed parallel top and bottom edges, and opposed parallel side edges;

said front plate member having a flat front surface, a flat back surface, opposed parallel top and bottom edges, and opposed parallel side edges;

said back plate member permanently affixed to said front surface of said first arm member forming said bracket and projecting outwardly therefrom and parallel to the plane defined by said leg portion of said first arm member;

a piano hinge extending along the joint formed between adjacentmost parallel side edges of said back plate and said front plate and hingedly connecting said front plate to said back plate for rotation of said front plate relative to said back plate between an open position wherein said front and back plates are co-planar, and a closed position wherein said front plate completely overlies said back plate with said front plate front surface disposed in adjacentmost juxtaposition with said back plate front surface;

an elongated flat rectangularly shaped flange forming member extending parallel to said hinged side edge of said front plate and affixed permanently to said back surface thereof in a manner overlying said hinged side edge to form therewith a shoulder portion overlying and engaging the adjacentmost back surface of said back plate when said front plate is in the open position, said flange member limiting the open position of said front plate to maintain said front plate co-planar with said back plate when in the open position;

a spring biased clip affixed to the top edge of said back plate and extending along a portion thereof and projecting forwardly of said back plate front surface and downwardly from said top edge to overlie a portion of said back plate front surface, the clip adapted for removably affixing to said back plate the shopping list by engaging a top edge of the shopping list beneath the clip to resiliently hold the same to the back plate;

an aperture provided in said front plate centrally therof and adjacent said top edge thereof;

an elongated flexible cord having one end affixed to said front plate by being tied through said front plate aperture, the opposite free end of the cord extending downwardly from said aperture along said front surface of said front plate; and

a writing instrument affixed to said free end of said cord for retention of said writing instrument to said front plate;

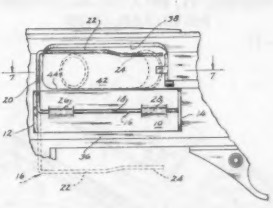
whereby said bracket may be adjustably secured to said shopping cart for holding a shopping list secured to said back plate in a manner projecting above said handle in a hand-free manner with said writing instrument readily available for the marking of said list while shopping.

3,881,268

SHELL CATCHER FOR GUNS

Clarence C. Petersen, 2221 Ashland Ave., Racine, Wis. 53403

Filed Sept. 28, 1973, Ser. No. 401,686
Int. Cl. F41c *27/00*
U.S. Cl. 42—1 T **5 Claims**



1. In a gun having a receiver portion, said receiver portion having a loading and ejecting opening therein, a shell catcher affixed to said receiver portion adjacent to said loading and ejecting opening and comprising a base, a shell retainer having a shaft portion defined by a fore-and-aft axis and pivoted on said base, said shaft portion terminating forwardly in an arm extending laterally relative to said shaft, said arm terminating in a rearwardly-extending finger portion.

3,881,269

AUTOMATIC FISHING DEVICE

James Edward Timmons, Newark, Calif., assignor to John Nicolls, Fremont, Calif.

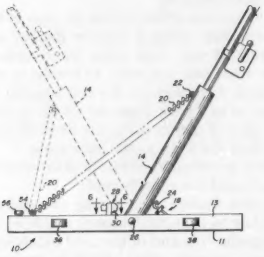
Filed Aug. 16, 1974, Ser. No. 497,837
Int. Cl. A01k *97/10*
U.S. Cl. 43—15 **11 Claims**

1. An automatic fishing device comprising:

a base;

a receiving tube pivotally mounted to said base for receiving the handle portion of a fishing rod therein, said receiving tube having a first spring connector and a trigger connector;

an adjustable spring mount engaged to said base, said adjustable spring mount including a track and a carriage assembly movably mounted within said track for lateral movement relative to the pivot of said receiving tube, said carriage assembly having a second spring connector and



a locking means for locking said carriage assembly in place on said track at selected positions;

a spring connected at one end to said first spring connector of said receiving tube and at the other end to said second spring connector of said carriage of said adjustable spring mount; and

a trigger mount connected to said base for engaging said trigger connection of said receiving tube for holding said receiving tube in a loaded position opposing the force exerted by said spring.

3,881,270

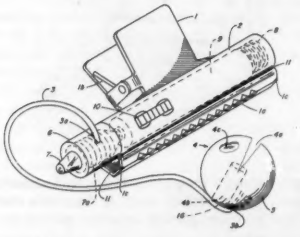
BITE INDICATING DEVICE

Herbert K. Olcott, Keansburg, Middletown Township, N.J. 07748

Filed July 11, 1973, Ser. No. 379,541

Int. Cl. A01k *97/12*

U.S. Cl. 43—17 **4 Claims**



1. A bite indicating device comprising a springloaded clip attachable to the legs of a line guide on a fishing rod with a fishing line extending through said line guide, said clip having a pair of semi-circular portions biased together by spring means to form a cylindrical housing and serrated edges along the outer sides of said semi-circular portion, said serrated edges engaging the legs of a line guide, a flashlight having a bulb housing disposed in said cylindrical housing, a flexible insulated conductor wire connected to the flashlight bulb and extending outwardly through the bulb housing attached at its outer end to a ball coated with conductive metallic material and formed with a tapered slot therein, said ball engaging the fishing line rearwardly of the line guide with the line being frictionally retained in the ball slot, whereby a pull on the line causes the said ball to engage the line guide and complete an electrical circuit to actuate the flashlight, thus indicating the bite of a fish.

3,881,271

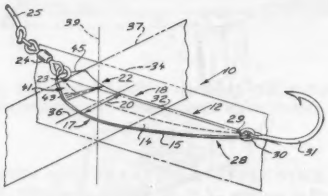
FISHING LURE

Sylvester Jacura, Victoria, British Columbia, Canada, assignor to Gibbs Tool and Stamping Works Ltd., Burnaby, British Columbia, Canada

Filed Apr. 8, 1974, Ser. No. 458,513

Int. Cl. A01k *85/04*

U.S. Cl. 43—42.5 **10 Claims**



1. A fishing lure having an elongated curved body portion of stiff thin sheet material, the body portion having first and second faces having a perimeter defined in part by spaced side edges, the lure having a maximum width defined by maximum spacing between the side edges, the body portion being further characterized by:

i. a forward portion having a forward opening to accept a line swivel connector,

ii. an aft portion having an aft opening to accept a hook connector,

iii. a longitudinal axis defined as a straight line passing through the forward and aft openings,

iv. a longitudinal plane containing the longitudinal axis and disposed generally normally to the faces of the body portion,

v. a transverse axis extending across the lure normally to the longitudinal plane adjacent the maximum width position of the lure,

vi. a transverse plane containing the transverse axis and disposed normally to the longitudinal plane and generally normally to adjacent faces of the body portion, and intersecting the longitudinal plane at a vertical axis,

vii. the forward end portion having a generally plane deflector portion provided with the forward opening, the deflector portion being inclined to, and merging smoothly from, the aft portion through a fold extending obliquely across the body portion, the deflector portion having an inner edge defined by the fold and a leading edge generally parallel to the inner edge, the fold having a fold axis inclined to the longitudinal axis at a rake angle of between 40° and 80°,

viii. an oblique plane disposed generally normally to the faces of the body portion and intersecting the longitudinal and transverse planes on the vertical axis, thhe oblique plane being normal to the fold axis so that,, within a plane parallel to the deflector plane, the deflector portion is inclined to the transverse plane at a deflector angle of between 10° and 60 °,

ix. the perimeter of the body portion is defined by first and second essentially straight aft side edges converging rearwardly from the maximum width position toward the aft end at essentially equal angles to the longitudinal axis, and first and second forward side edges extending forwardly from the maximum width position, the first forward side edge curving forwardly to intersect the longitudinal axis at a nose spaced forwardly of the forward opening, the second forward side edge continuing as an essen-

tially straight line coplanar with the second aft side edge and inclined at the deflector angle to a tip at one end of the deflector leading edge, the deflector leading edge defining a portion of the perimeter and extending to the nose,

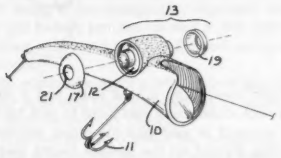
curvature and asymmetry of the lure being such that when the lure is used in trolling it describes a motion similar to that of a wounded or frolicking small fish characterized by short period oscillations generally about the vertical axis, followed by a series of uncompleted hesitation rolls terminating with a snap roll through 360° about the longitudinal axis, followed by short period oscillations and a repeating of the action above in an opposite direction.

3,881,272

FISHING LURE EYE ASSEMBLY

Douglas W. Parker, 3015 Free Ferry, Fort Smith, Ark. 72901

Filed Oct. 1, 1973, Ser. No. 401,996
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.34 **3 Claims**



3. An eye assembly for a fishing lure having a lure body with an eye mounting surface, said eye assembly comprising:

a separate iris structure having a central circular hole extending therethrough, a convex exterior surface, and a lure body engaging rear surface for fixedly securing the iris structure on the eye mounting surface of said lure body; and

a pupil structure integrally formed with said lure body and having a cylindrical stem with a diameter substantially equal to the diameter of said hole through said iris structure;

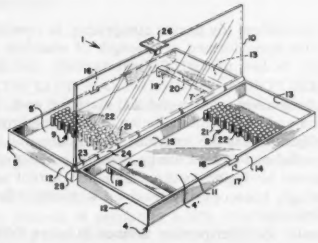
whereby said stem is adapted to engageably penetrate said hole in said iris to thereby fix said iris in concentric alignment with said pupil on the lure body.

3,881,273

HOOK AND LEADER STORAGE STRUCTURE

John Luther Herring, 2626 S. 48th Ter., Kansas City, Kans. 66106

Filed July 30, 1973, Ser. No. 383,528
Int. Cl. A01k *97/06*
U.S. Cl. 43—57.5 R **3 Claims**



1. A hook and leader storage structure comprising:

a. a container having an outer wall and wall means extending therefrom, said wall means comprising laterally spaced front and rear walls and a pair of longitudinally spaced end walls each extending from said outer wall and each having a free edge;

b. means mounted on said wall means for selectively covering and uncovering said container, said means for covering and uncovering said container being movably mounted on said rear wall and movable to a position overlying the free edge of each of said front and rear walls and said end walls;

c. means in said container and spaced from said wall means for supporting a plurality of spaced fishing hooks, said means for supporting fishing hooks being positioned adjacent and spaced from one of said container end walls and comprising a bar extending transversely of said container and positioned substantially parallel with the one of said container end walls, said bar being adapted to support a shank portion of each fishing hook with a barbed portion thereof positioned between said container outer wall and said bar;

d. means in said container and spaced from said hook supporting means therein for engaging and retaining a plurality of leader lines each attached to a respective one of the fishing hooks, said means for engaging and retaining leader lines comprises a plurality of laterally spaced rows of longitudinally spaced flexible posts extending from said outer wall, said rows being in close proximity one with the other, each of said rows having a plurality of posts, said posts in each of said rows each being in longitudinally staggered relation with adjacent posts in adjacent rows of posts, said posts in adjacent staggered rows of posts each being positioned to be engaged by a leader line positioned between the adjacent staggered rows whereby a substantial length of the leader line is in retaining engagement with said adjacent staggered rows of posts; and

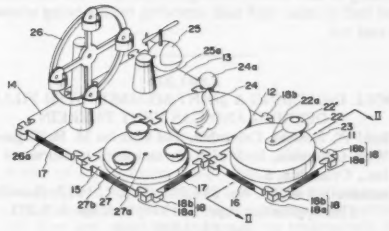
e. means on said means for covering and uncovering said container and engageable with said wall means for retaining said container covering means in a closed position.

3,881,274

INTERLOCKING UNITS HAVING MESHED GEARS AND DRIVE MEANS FOR A MOVABLE TOY THEREON

Yukio Kanda, Koshigaya, Japan, assignor to Okuma Seisakusho Co., Ltd., Soka-shi, Japan

Filed May 22, 1974, Ser. No. 472,149
Int. Cl. A63h *33/04*
U.S. Cl. 46—16 **4 Claims**



1. A toy assembly comprising:

a. a plurality of units, each unit including a base member and a gear mounted on said base member for rotation about an axis;

b. coupling means on each said base member for releasably coupling the base member to the base member of each of the other said units in a position in which the gears on the coupled base members meshingly engage each other;

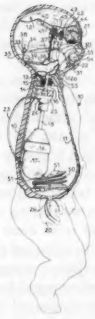
c. drive means on a first one of said base members for driving the gear rotatably mounted thereon;

d. a movable toy mounted on a second one of said base members in driving engagement with the gear on said second base member.

3,881,275
ANIMATED DOLL WITH MEMBERS CONTROLLED BY WEIGHTED, SWIVELED, SLIDABLY MOUNTED INTERIOR ROD

Raymond Gerard Baulard-Cogan, Louveciennes, France, assignor to Agence Nationale de Valorisation de la Recherche ANVAR, Neuilly-sur-Seine, France

Filed Feb. 19, 1974, Ser. No. 443,505
Int. Cl. A63h *11/02*
U.S. Cl. 46—119 **11 Claims**



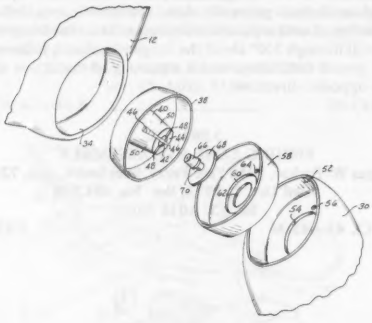
1. An animated doll comprising a body having movable and deformable members associated with said body, each member being provided with a respective actuating means connected thereto, a hollow space formed in said body, a movable ponderable ball-like member mounted for movement inside the hollow space of the body and transmitting means for transmitting the displacements of said ball-like member to said actuating means, said transmitting means comprising a rod movable in said hollow space, said ball-like member being mounted like a counterweight at one end of said rod, means movably mounting said rod comprising a swivel bearing fixedly mounted in said body of the doll, said rod freely sliding and rotating in said swivel bearing according to the movement of said ball member and said actuating means being connected to said rod.

3,881,276
DOLL INCLUDING A JOINT MEMBER WITH FILLING OPENING AND GAS VENT THEREIN

Witold W. Kosicki, Columbia, and Charles M. Hollingsworth, West Columbia, both of S.C., assignors to Horsman Dolls Inc., Columbia, S.C.

Continuation of Ser. No. 311,227, Dec. 1, 1972, abandoned. This application Apr. 9, 1974, Ser. No. 459,271
Int. Cl. A63h *3/46*
U.S. Cl. 46—162 **11 Claims**

1. In a doll, an assembly including a torso skin of relatively soft synthetic resin formed with a joint recess, a generally cup-shaped socket-forming member of relatively rigid synthetic resin secured in said recess, said socket-forming member having a frusto-conical boss provided with an end wall having an opening therein, said boss being provided with slots extending into said opening to form a plurality of resilient fingers around said opening, a filling of foamed synthetic resin in said torso skin, a filled limb on said doll, said limb comprising a limb skin of relatively soft synthetic resin and a filling of foamed synthetic resin in said limb skin, said limb skin having a joint recess, a generally cup-shaped plug-mounting member of relatively rigid synthetic resin secured in said limb joint recess, said limb having means enabling the filling of the limb skin with the foamed resin after said plug-mounting member has been secured in said limb joint recess, said means comprising a filling opening and gas vent in said limb skin recess and a corresponding filling opening and gas vent in said plug-mounting member and registering with said limb recess filling opening and gas vent, and a plug member of relatively rigid

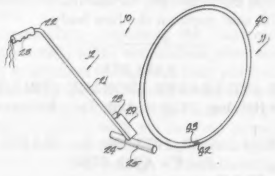


synthetic resin comprising a base plate and a frusto-conical head and a neck connecting said head to said base plate, said base plate secured in said plut-mounting member over the filling opening thereof on the surface facing away from said limb joint recess, said head adapted to be inserted into said boss through the boss opening and to be retained therein by said fingers.

3,881,277
ROLL-O-WHEEL TOY DEVICE

Bob Delph, and Carl Amburgey, both of Rt. 8, Box 260, London, Ky. 40741

Filed Jan. 7, 1974, Ser. No. 431,575
Int. Cl. A63l *33/02*
U.S. Cl. 46—220 **1 Claim**



1. A roll-o-wheel toy device comprising, in combination:
a circular hoop formed of a length of seamless extruded plastic hollow tubing of a substantially circular cross-section;
said tubing having a first end and a second end;
said first end of said tubing being of the same cross-section configuration as the length of said tubing;
said second end of said tubing being of a reduced exterior diameter having an exterior diameter thereof adapted to be snugly telescopically received within said first end of said tubing;
an annular shoulder portion defined between said reduced portion of said second end of said tubing and said main body length of said tubing, said shoulder being of a truncated conical configuration having its truncated apex portion formed contiguous with said reduced portion and having its base portion formed contiguous with said main body length of said tubing;

the outermost edge of said first end of said tubing adapted to engage said shoulder portion of said second end of said tubing when said reduced portion of said second end is axially inserted into said first end;

a coating of adhesive disposed about the exterior circumference of the cylindrical side walls of said reduced portion of said second end of said tubing and engaging the juxtapositioned interior circumferal surfaces of said first end of said tubing when the reduced end portion is telescopically inserted into the first tubing end to fixedly secure said ends of said tubing permanently together and seal the hollow interior of said tubing from the atmosphere;

a liquid disposed in said hollow interior of said tubing to provide varying characteristics to said hoop as to weight and stability as it is rolled along on its peripheral edge with the liquid constantly shifting its position within the hollow tubing;

a guide stick for effecting the propelling, rolling, guiding and maneuvering of said hoop along any desired path, said guide stick including a shaft, a handle portion, a head portion, a guide rod, and a push block;

said shaft being of an elongated cylindrical configuration having said handle portion formed at the top end thereof and having said head portion formed along the bottom end thereof;

said handle portion being of a tubular configuration formed integrally with said shaft and bent at an angle to the axis of said shaft rearwardly thereof;

a handle member received about the projecting free end of the handle portion and provided with a series of adjacent finger gripping partially annular grooves disposed along a bottom segment of the circumference thereof adapted to receive the fingers of an individual's hand firmly therein to assist the individual in the firm holding and guiding of the guide stick;

said head portion being formed integrally with said shaft and axially aligned therewith;

said guide rod being of an elongated cylindrical configuration fixed at a mid point to the bottom end of said head portion and projecting symetrically from opposite sides of said head portion normal to the plane defined by said shaft and said handle portion;

said push block being of elongated box like rectangular configuration having a face surface and a back surface with the back surface affixed to said head portion and the face surface projecting outwardly therefrom in a direction opposed to the direction of said handle portion and with the push block extending longitudinally along said head portion from a position adjacent said guide rod to a position spaced upwardly therefrom along said head portion;

an arcuate concave groove extending longitudinally completely through the face surface of said push block and adapted to engage the peripheral edge of said hoop therealong for use in the maneuvering of said hoop by said guide stick.

3,881,278

METHOD OF MAKING MULCH COMPOSITION

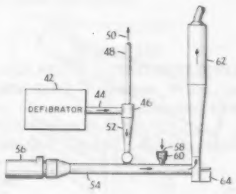
Otis R. Videen, Roseville, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 310,418, Nov. 29, 1972, abandoned. This application June 17, 1974, Ser. No. 479,831
Int. Cl. A01g *1/00*
U.S. Cl. 47—58 **7 Claims**

1. The process of preparing a dry, relatively free-flowing mass planting mulch material comprising:

a. defibrating vegetable material in the presence of steam;

b. adding a granular tackifier material to said defibrated material while it is still moist with from about 25 to about 100 percent water by weight of defibrated material and while it is under sufficient turbulence to create intimate admixture of the defibrated vegetable material and the tackifier material and at a temperature of from about 212° to about 375°F. to cause the granules of tackifier material to become attached to the defibrated vegetable material, said tackifier material being present in an amount of from about ½ to about 5 percent of said defibrated vegetable matter and said tackifier material being one which will pass Test FF–1 and Test I–357;



c. drying the admixture comprising defibrated vegetable material and tackifier under sufficient turbulence to keep the particles of defibrated vegetable material with attached tackifier material substantially discrete; and

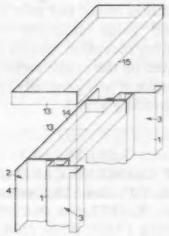
d. packaging the dried admixture comprising defibrated vegetable material with tackifier material attached thereto.

3,881,279

DOORFRAMES

Charles S. Kirton, 14 Dingler St., Rynfield, Benoni, Transvall Province, South Africa

Filed May 8, 1973, Ser. No. 358,324
Int. Cl. E06b *1/20*
U.S. Cl. 49—505 **5 Claims**



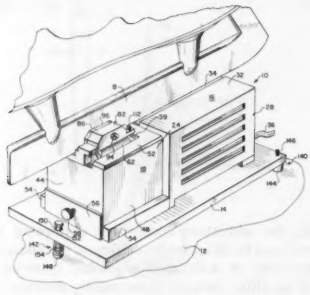
1. A stile of a door frame comprising:

a first elongated member having a first web portion,

a second elongated member having a second web portion, said first and second members being transversely and slidably adjustable to provide variable width to the stile, said first elongated member being channel-shaped in cross-section and comprising said first web portion and a pair of first flanges extending from said web portion adjacent each longitudinal edge thereof, one of said first flanges having an inwardly extending lip portion abutting and connected to said second web portion, and

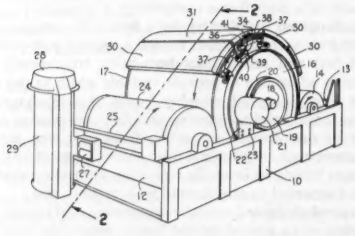
said second elongated member comprising said second web portion and a pair of second flanges extending from said web portion adjacent each longitudinal edge thereof, one of said second flanges extending from one side of said second web portion and the other of said second flanges extending from the other side of said second web portion, one of said second flanges having a lip portion abutting said first web portion.

3,881,280
ICE SKATE SHARPENING DEVICE WITH A FLOATING SKATE GUIDING MEMBER
Arnold M. Thompson, 181 Gary Ave., Wheaton, Ill. 60187
Filed Oct. 29, 1974, Ser. No. 518,235
Int. Cl. B24b *9/04*
U.S. Cl. 51—102 **10 Claims**



1. A skate blade sharpening device adapted to hollow grind the effective supporting edge of a skate blade and comprising a base plate adapted for positioning on a bench top or the like, an electric motor mounted on said base plate and having a drive shaft projecting forwardly therefrom, a circular abrasive grinding wheel fixedly mounted on the forward end of said shaft, a casing emcompassing said wheel and a portion of the shaft, the upper region of said casing being provided with an opening which exposes a limited peripheral region of the wheel for transverse application thereto of the skate blade at such time as the supporting edge of the latter is drawn progressively and longitudinally through the slot, a floating cradle member at least in part encompassing said shaft and capable of limited free oscillation about the axis of the shaft, and a blade-positioning and guide assembly defining a blade-receiving slot for sliding reception therein of the skate blade and adjustably mounted on the cradle member for small increments of lateral adjustment in a generally tangential direction with respect to the grinding wheel.

3,881,281
METHOD OF GRINDING CARD CLOTHING
John D. Hollingsworth, P.O. Box 516, Greenville, S.C. 29202
Filed Mar. 7, 1973, Ser. No. 338,911
Int. Cl. D01g *15/00;* **B24b** *1/00, 19/18*
U.S. Cl. 51—281 R **2 Claims**



1. The method of grinding the teeth of metallic card clothing on a roll of a textile carding machine comprising the steps of:

A. removing a carding surface opposite said card clothing on the roll;

B. placing a substantially stationary abrasive concave grinding surface in grinding relation transversely of the card clothing on the roll so that said grinding surface extends substantially entirely across the roll and engages the teeth of the card clothing;

C. restraining said grinding surface against arcuate movement about the roll during grinding;

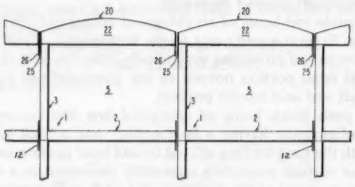
D. imparting rotation to the roll causing the grinding to result substantially entirely from the rotation of the teeth with respect to such stationary grinding surfaces; and

E. removing the grinding surface from the roll after a predetermined amount of grinding of the teeth has been accomplished.

3,881,282
ABRASIVE GRAIN OF FUSED ALUMINA-ZIRCONIA-CERIA ALLOY
George R. Watson, Niagara Falls, Ontario, Canada, assignor to Norton Company, Worcester, Mass.
Filed Oct. 24, 1973, Ser. No. 409,323
Int. Cl. C04c *1/68;* **C04b** *31/16*
U.S. Cl. 51—309 **4 Claims**

1. An improved fused crushed abrasive grain consisting essentially of a co-fusion of alumina, zirconia and ceria; said zirconia being present in a range of from 10 to 60% by weight; the ceria being present in a range of from 1 to about 7%.

3,881,283
MODULAR HOUSING STRUCTURE
David R. Pender, 1018 Marion St., Columbia, S.C. 29201
Filed Sept. 10, 1973, Ser. No. 395,517
Int. Cl. E04h *1/04, 9/06*
U.S. Cl. 52—79 **8 Claims**



1. A plural level multi-family dwelling comprising plural horizontal and vertical rows of front-to-back elongated rectangular cross section dwelling compartments, said dwelling compartments formed by a plurality of substantially identical right angular front-to-back elongated L-modules, said modules arranged in said dwelling so that a horizontal wall of each module forms the floor of one dwelling compartment and the ceiling walls of the dwelling compartment immediately therebelow, and a vertical wall of each module forms the party wall between two laterally adjacent dwelling compartments in one level of the dwelling, the opposite faces of the horizontal and vertical walls of the modules having finishing material thereon, attachment means for the plural L-modules of said dwelling comprising plural spaced readily bendable strap anchors secured to the longitudinal front-to-back edge of the horizontal wall of each module and extending above and below the horizontal wall for attachment by nailing to the vertical walls of a like module on the same level and a like module on the next lowermost level of the dwelling, each such strap anchor having its upper end nailed to the vertical wall of the next adjacent module on the same level at a point near and above the horizontal wall of that module and having its lower end nailed to the vertical wall of the next underlying module at a point near the top of such wall, additional laterally spaced readily bendable strap anchors secured to each L-module at the juncture of its horizontal and vertical wall s and serving to join such walls in structurally assembled relationship and

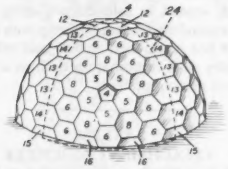
having lower terminal end portions projecting below said horizontal wall of each module, said lower terminal end portions nailed to the vertical wall of the next lowermost module to complete the structural joining of L-modules in the plural levels of said dwelling, means forming an end wall for said plural level dwelling adjacent the endmost vertical row of L modules having open sides, and roofing means for the uppermost horizontal row of L-modules in said dwelling.

3,881,284

ELLIPSE DOMED STRUCTURE

Roy H. Martin, McCamey, Tex., assignor to Frankie SoRelle, Sweetwater, Tex., a part interest

Filed Nov. 1, 1973, Ser. No. 411,771
Int. Cl. E04b *1/32*
U.S. Cl. 52—81 **2 Claims**



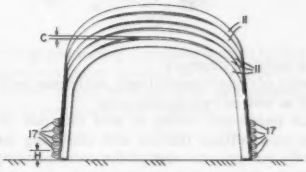
1. A self-supporting, elliptical, dome structure comprising a plurality of rigid, polygonal panels secured together around their peripheral edges to define a hollow enclosure having a generally horizontal bottom edge, said panels including a plurality of hexagonal panels and a plurality of pentagonal panels having their edges connected, all of said panels being flat and provided with an inwardly extending flange along each edge thereof, each edge flange being straight and flat, said edge flanges and the flat panel having an included angle of substantially 83°, said panels being arranged with a pentagonal panel at the apex of the dome structure with the five side edges thereof being of equal length and the included corner angles being equal, five arcuate rows of hexagonal panels disposed outwardly and arcuately downwardly from the apical pentagonal panel along arcuate paths defining great circles of the dome structure, the top and bottom edges of the hexagonal panels being equal in length to the side edges of the apical pentagonal panel, said rows of hexagonal panels defining five identical spherical isosceles triangles each having an apex in the center of the apical pentagonal panel, two sides defined by lines through the centers of the rows of hexagonal panels and a base along the bottom edge of the dome structure, each spherical isosceles triangle including a central pentagonal panel oriented centrally between the arcuate rows of hexagonal panels and having its base line generally parallel to the bottom edge of the dome structure, a first circular row of five identical hexagonal panels encircling and connected to each of said central pentagonal panels, a second circular row of ten hexagonal panels encircling and connected to the first row of five hexagonal panels with three of the hexagonal panels at opposite portions of the second row being connected with the hexagonal panels in the arcuate rows and the lowermost hexagonal panel in the second row having its lower edge defining a portion of the bottom edge of the dome structure, a group of three connected upper filler hexagonal panels connected to the second circular row of hexagonal panels and the arcuate rows of hexagonal panels, a lower filler hexagonal panel connected to the second circular row of hexagonal panels and each arcuate row of hexagonal panels with the lower edge of each lower filler hexagonal panel defining a portion of the bottom edge of the dome structure, each arcuate row of hexagonal panels having a half hexagonal filler panel connected thereto with the lower edge thereof defining a portion of the bottom edge of the dome structure, and a half hexagonal filler panel connected to the lowermost panel in the second circular row of panels and each of the lower hexagonal filler panels with the lower edges thereof defining a portion of the bottom edge of the dome structure, said dome structure being enlarged by increasing the length of each side of the apical pentagonal panel, each top and bottom edge of each hexagonal panel in each arcuate row and the top and bottom edge of each half hexagonal filler panel in each arcuate row while leaving all other pentagonal and hexagonal panels the same size and in the same orientation.

3,881,285

STACKING AND ELONGATING BUILDING STRUCTURE

Robert F. Schumaker, Bremerton, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 24, 1973, Ser. No. 400,490
Int. Cl. E04b *1/32*
U.S. Cl. 52—86 **2 Claims**



1. A building structure comprising:

a. an elongated structure having a ceiling and first and second side walls but no floor or end walls;

b. the first and second respective bottom edges of said first and second side walls extending outwardly further than the upper sections of said first and second side walls;

c. a first elongated beam connected to the outward side along said first bottom edge of said first said wall;

d. a second elongated beam connected to the outward side along said second bottom of said second side wall;

e. each of said first and second elongated beams comprising a U-beam having a cross section including a vertical section and first and second short legs extending therefrom;

f. said first and second short legs extending outwardly from the side walls of said elongated structure;

g. the bottom surfaces of said second short legs of said first and second elongated beams extending below the first and second bottom edges of said first and second side walls;

h. the width of the ceiling of said building structure being less than the distance between the upper and lower surfaces respectively of said first and second short legs of each of said first and second elongated beams;

i. first and second lifting plates connected near the opposite ends of each of said beams and rigidly positioned between said first and second short legs and extending outwardly from said beams and rigidly positioned at positive and negative angles;

j. each end of each of said first and second side walls of said building structure includes an opening forming half a door opening and the positioning of two of said structures end to end forms a full door opening;

k. a flexible joint cover for connecting the ends of said structures when they are positioned end to end and said flexible covering including a door that is co-extensive with said full door opening; and

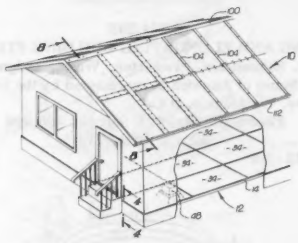
l. whereby at least two building structures may be stacked one upon the other wherein the beams of each of said at least two building structures rest against each other and maintain a separation between said at least two building structures.

3,881,286

PREFORMED FLOOR AND ROOF STRUCTURE

Edward A. Smith, 6641 W. 6th St., Los Angeles, Calif. 90048, and Robert L. Day, 1518 Grismer St., Burbank, Calif. 91504

Filed July 23, 1973, Ser. No. 381,529
Int. Cl. E04b *2/56*
U.S. Cl. 52—90 **7 Claims**



1. In a building structure:

a. a series of spaced parallel rails, said series including inside rails as well as two outside rails;

b. each inside rail having at least one pair of connector structures affixed thereto and extending laterally outwardly on opposite sides of the corresponding inside rail at a place located intermediate the length of the said inside rail;

c. each outside rail having at least one connector structure affixed thereto extending laterally inwardly on one side at an intermediate place corresponding to the location of said pair of connectors;

d. a series of tubular braces extending perpendicular to the said series of rails and connected at opposite ends to adjacent rails by telescopically receiving and fitting said connector structures to form a rigid substantially rectangular grid;

e. mechanical means operative between each connector and the corresponding brace ends to lock the braces to the connectors at a predetermined relative telescoped position therebetween;

f. said rails and braces being dimensionally controlled to determine the configuration of the grid;

g. a plurality of rectangular panels interfitting the grid, each panel comprising a pair of outer plies and a substantially rigid core, the outer plies overlying the rigid core to form a peripheral groove;

h. said braces and said series of rails each laterally projecting into said peripheral panel grooves to lock the panels to said grid;

i. said panels being dimensionally controlled to prevent interference in the fit of said rails and braces.

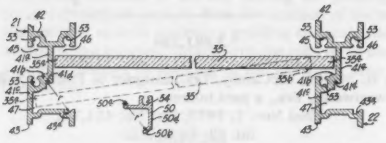
3,881,287

GLASS FRAMING SYSTEM

Lawrence F. Biebuyck, Mesquite, Tex., assignor to Kawneer Company, Inc., Niles, Mich.

Continuation of Ser. No. 401,592, Sept. 28, 1973, abandoned, which is a continuation of Ser. No. 197,705, Nov. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 59,915, July 31, 1970, abandoned. This application Aug. 21, 1974, Ser. No. 499,216
Int. Cl. E04b *2/60*
U.S. Cl. 52—127 **11 Claims**

1. In combination, a construction element of the type including transversely aligned inner and outer face portions and interconnecting portions, said interconnecting portions including a longitudinally extending transverse web having one edge integrally secured to one of said face portions intermediate its width and forming the bottom of opposed shallow glazing pockets, a longitudinally extending web extending from the other edge of the first mentioned web in one direction therefrom, and a longitudinally extending transverse jamp web extending from the edge of said second mentioned web to the other of said face portions to define a deep glazing pocket contiguous with one of said shallow glazing pockets;



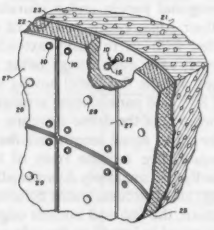
and a mullion filler locked to said construction element and including a longitudinally extending web normal to the first mentioned web seated in said deep glazing pocket, and a longitudinally extending transverse jamp web extending from the edge of the last mentioned web to said other of said face portions whereby said combination defines a mullion having opposed shallow glazing pockets.

3,881,288

ATTACHMENT ASSEMBLY

H. Peter Fay, Solana Beach, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed May 4, 1972, Ser. No. 250,363
Int. Cl. G21 *13/00*
U.S. Cl. 52—224 **2 Claims**



1. In a pressure vessel, a wall assembly comprising, a fixed rigid metal liner for the pressure vessel, a plurality of rigid metal panels spaced from said liner to form an insulating space, a resilient compressible fibrous thermal insulation material filling said insulation space between said panels and said liner, said panels being displaceable toward said liner to compress said insulation, and a plurality of attachment assemblies securing said panels to said liner with said fibrous thermal insulation under compression, each of said attachment assemblies comprising a flexible cable, first and second shank balls secured toward opposite ends of said cable, a first ball socket secured to said liner, said first shank ball being received and secured in said ball socket to secure one end of said cable to said liner, each of said attachment assemblies also having a second ball socket secured to one of said panels and secured about said second shank ball, said cable being under tension provided by said compressed insulation.

3,881,289

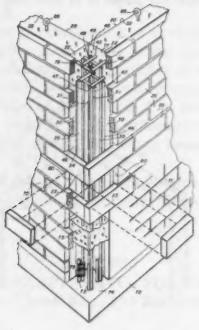
BUILDING WALLS AND PREFABRICATED REINFORCED CONCRETE WALL SECTIONS

Curtis Mauroner, 627 W. Concord, Orlando, Fla. 32801

Filed Aug. 20, 1973, Ser. No. 386,830
Int. Cl. E04c *2/06*
U.S. Cl. 52—259 **8 Claims**

1. A prefabricated exterior wall section for a building, said section being supported upright on a foundation therefor and

having interior and exterior side faces, said section comprising a pair of substantially rectangular, reinforced concrete panels that are spaced apart in a face to face arrangement and respectively located at said interior and exterior side faces of said section, and an elongated horizontally arranged reinforced concrete lintel that is supported by and overlies the space between said panels; said lintel comprising a concrete structure and reinforcing means embedded in said concrete structure, each of said panels having an upper portion and comprising a concrete structure which is joined along its upper portion to and precast integrally with the concrete



structure of said lintel, and each of said panels comprising reinforcing means embedded in its concrete structure; said section further comprising a plurality of elongated metal elements that are spaced apart and extend through the space between said panels, each of said elements having opposite ends which are embedded in the respective concrete structures of said panels and secured to the respective reinforcing means embedded therein, the concrete structure of said lintel having opposite end surfaces that lie in respective vertical planes, and each of said panels having opposite side edge surfaces that respectively lie in said vertical planes.

3,881,290
GLAZED IMPERVIOUS SHEET ASSEMBLY AND METHOD OF GLAZING

George J. Bouchey, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,399
Int. Cl. E04b *1/66;* **E06b** *1/04*
U.S. Cl. 52—398 **11 Claims**

1. A glazed, weathertight sheet assembly for a wall opening comprising:

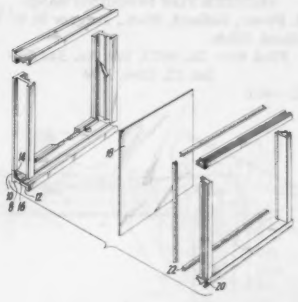
i. an exterior stop adapted to engage the marginal edges about an opening in an outside wall, said stop being L-shaped in cross-section, the vertical leg of said stop extending into the opening and the horizontal leg of said exterior stop extending from the wall toward the inside;

ii. a continuous ridge of resilient pressure sensitive tape affixed to the inside face of the vertical leg of said exterior stop adjacent to the inner periphery of said exterior stop, the inwardly presented face of said tape being adapted to receive an impervious sheet member;

iii. a toe bead of silicone rubber composition around the outer periphery of the ridge of said resilient tape, said bead bridging the tape edge and the inside face of the vertical leg of said exterior stop;

iv. an impervious sheet member in full weathertight engagement around its outwardly presented edge with the inwardly presented face of the ridge of resilient tape and the toe bead of said silicone composition; and

v. an interior stop framing the exterior stop and the impervious sheet member, said interior stop being affixed to the

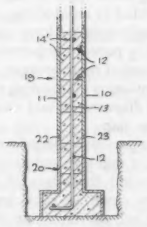


exterior stop and having a resilient surface biased against the impervious sheet member so as to prevent inward displacement of said member from said opening and to maintain its position in said opening.

3,881,291
PANEL MOLD FOR FORMING COMPOSITE CONCRETE-REINFORCED WALLS

Melvin E. Layne, 7063 Alden Ave., Los Angeles, Calif. 91335

Filed July 19, 1973, Ser. No. 380,769
Int. Cl. E04b *2/86*
U.S. Cl. 52—426 **3 Claims**



1. A panel for forming composite concrete-reinforced walls comprising:

a pair of parallel sheets composed of pressed composition material having opposing wall surfaces in fixed spaced apart relationship defining an open space therebetween;

a plurality of rigid rod members extending between said sheet opposing wall surfaces maintaining said pair of sheets in their fixed parallel relationship;

each of said sheets having top and bottom edge marginal regions incorporating an elongated notch so as to provide a registering means for mating with and bearing against similar adjoining panels;

a concrete core occupying said open space between said sheet opposing wall surfaces so as to form an interlocking composite wall structure of rod members, said sheets and said concrete core;

additional steel reinforcements extending normal to said rod members and interlocked by said concrete core;

bonding means attaching the opposite ends of said rod members to the respective wall surfaces of said sheets; and

each opposing wall surface of said sheets is provided with a plurality of aligned pairs of recesses for insertably receiv-

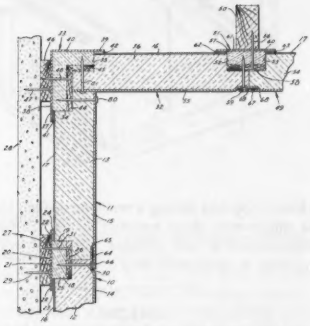
ing the opposite respective ends of each of said rod members and for holding said bonding means.

3,881,292

INSULATING STRUCTURAL ASSEMBLY AND STUD MEMBER FOR FORMING SAME

William H. Porter, Holland, Mich., assignor to W. H. Porter, Inc., Holland, Mich.

Filed Mar. 26, 1973, Ser. No. 344,569
Int. Cl. E04c *1/04*
U.S. Cl. 52—461 **11 Claims**



1. In combination, a structural assembly comprising:
1. abutting insulating panels, each having:
   a. a foamed core slab of an insulating material,
   b. a rigid facing sheet affixed to the core slab on one side thereof which facing sheet has at least one portion thereof which overlaps the underlying foam core slab and the facing sheet from an adjacent panel, and
   c. a recess provided at an abutting edge of said core slab extending longitudinally along said edge, the recesses of two abutting panels cooperating to define a continous open channel therebetween,
2. an elongated insulating connecting stud member complementary to and disposed in said channel, comprising:
   a. a foamed core slab,
   b. a moisture-impervious sheet-form layer affixed to an outer surface of said slab and having margins extending outwardly beyond the edges of said slab to provide lateral flanges covering each juncture between said stud member and the core slab of said adjacent abutting insulating panels, and
   c. a relatively hard attachment member affixed to the other side of said stud member foamed core slab, and
3. attachment means securing said panels to said attachment member **2**(*c*).

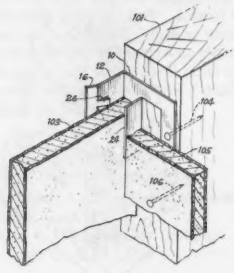
3,881,293

CORNER CONSTRUCTION AND BACK UP BRACKET THEREFOR

John Conville, 13515 Oval Dr., Largo, Fla. 33540

Continuation of Ser. No. 322,410, Jan. 10, 1973, abandoned, which is a continuation of Ser. No. 103,298, Dec. 31, 1970, abandoned, which is a continuation of Ser. No. 776,578, Nov. 18, 1968, abandoned. This application Aug. 15, 1974, Ser. No. 497,580
Int. Cl. E04b *1/38;* **E04c** *5/00;* **F16b** *5/06*
U.S. Cl. 52—712 **2 Claims**

1. A back-up clip for corner construction of wall panels consisting of a single piece of sheet material having
1. a flat body portion dimensioned to have a length greater than the thickness of the wall panels;
2. a first flanged member extending substantially perpendicularly from one edge of the body portion;
3. a second flanged member struck-out from and extending continuously substantially perpendicularly from an intermediate portion of the flat body portion in the same direction as the first flanged member and in substantially parallel relation therewith, and spaced therefrom by an amount corresponding to the thickness of a first panel for receiving an edge portion of the first panel therebetween;
4. said second flanged member terminating in a free edge, the dimension of said second flange member between said flat body portion and said free edge corresponding to the thickness of a second panel so that when a second panel is positioned parallel to and in abutting relation with the body member and with the edge of the second panel abutting the second flanged portion, the latter will be substantially concealed by the second panel while the edge of the second panel is in abutting relationship with



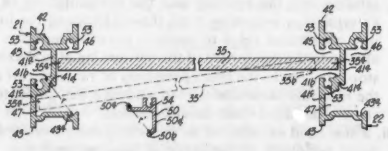
the second flanged member substantially throughout its width;
5. the first flanged member having its free outer edge portion inclined at a slight angle in the direction away from the second flanged member to provide an entrant portion for the first panel into the space between the first and second flanged members; and
6. spring members struck from the first flanged portion adjacent the inclined portion and extending angularly inwardly into the space between the first and second flanged members and in a direction towards the second flanged member and the body portion to prevent retraction movements between the first panel and clip once the first panel has cleared the spring fingers during movement into the space between the first and second flanged members.

3,881,294

CONSTRUCTION ELEMENT FOR GLASS FRAMING SYSTEM

Lawrence F. Biebuyck, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Continuation of Ser. No. 277,638, Aug. 3, 1972, abandoned, which is a continuation of Ser. No. 59,915, July 31, 1970, abandoned. This application Mar. 15, 1974, Ser. No. 451,526
Int. Cl. E04c *3/32, 2/38*
U.S. Cl. 52—720 **16 Claims**



4. A construction element having inner and outer face portions and interconnecting portions, said interconnecting portions and said face portions defining a pair of glazing pock-

ets for retaining the edges of adjacent panels, one of said glazing pockets being a stepped pocket, said interconnecting portions including a web member forming a bottom surface of one portion of said stepped pocket and further including a web member forming a bottom surface of a second portion of said stepped pocket, said web portions being laterally disposed.

3,881,295
DISPOSAL SYSTEM

Robert L. Derby, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 20, 1973, Ser. No. 353,194
Int. Cl. B65b *3/00*; **B65f** *1/00, 5/00*
U.S. Cl. 53—21 R **5 Claims**

1. A method for the disposition of ecologically undesirable polymer swelling liquid, the steps of the method comprising

containing the liquid within particles of a liquid swellable solid cross-linked vinyl addition resinous polymer having a swelling index of from about 2 to 50, the liquid being present in a quantity at least sufficient to form a gel, said swellable resinous particles being located within a container,

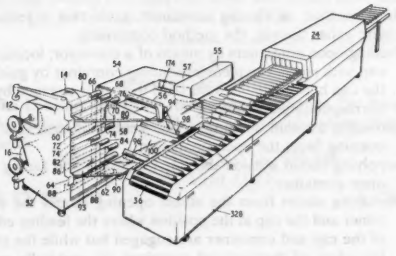
containing said gel in a shipping container, and

transferring said shipping container to a disposal site.

3,881,296
METHOD AND APPARATUS FOR PACKAGING

Frederick Douglas Clavell Bate, 155 Barkerhouse Rd., Nelson, England

Filed Mar. 15, 1973, Ser. No. 341,526
Claims priority, application United Kingdom, June 29, 1972, 30399/72
Int. Cl. B65b *9/02, 9/14, 43/08*
U.S. Cl. 53—30 **33 Claims**

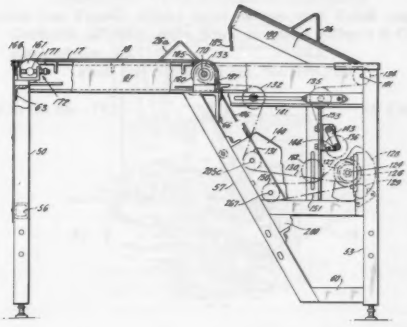


1. A method of forming a package containing an article comprising the steps of feeding a web comprising two layers of wrapping film in close juxtaposition along aligned paths of travel in the same direction, inserting an expansible tube opening device between said two layers of film, causing a sealed relationship between said two layers of film in separate transversely extending areas located at opposite sides of the inserted device and spaced apart relative to said direction of travel to form a compartment for said inserted device, severing the web at said areas to separate said compartment from said web, then expanding said inserted tube opening device for opening out said compartment to form a tube having at least one open end and frictionally grip the interior of said tube, and supporting and conveying said severed tube in said direction of travel by said tube opening device while inserting an article to be packaged into the open end of said tube.

3,881,297
BOTTOM-WRAP APPARATUS

George T. Rushforth, Costa Mesa, Calif., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,143
Int. Cl. B65b *57/12, 41/16*
U.S. Cl. 53—74 **9 Claims**



1. Bottom wrap applying apparatus comprising, in combination:

frame support means,

a rotatable paper roll support shaft supported by said frame support means,

a web storage means for storing up to a given length of web as it unrolls from the paper roll supported by said support shaft,

a first pair of paper drive rolls for receiving said web from said web storage means and for moving said web out of said web storage means and supported relative to said frame support means, first roll drive means connected with said first drive rolls for rotating them;

a second pair of paper drive rolls disposed parallel to and spaced from said first pair of paper drive rolls for moving said web away from said first pair of paper drive rolls and supported relative to said frame support means, second roll drive means connected with said second drive rolls for rotating them;

an elongaged cut-off knife means supported relative to said frame support means disposed between said first and second pairs of paper drive rolls for cutting said web,

means connected to said first and second pairs of paper drive rolls for simultaneously engaging said web between both said first and second pairs of paper drive rolls, said second roll drive means rotating said second pair of rolls while said first roll drive means resists rotation of said first pair of rolls and this while said elongated cut-off knife means is operated to cut said web,

a top support surface on said frame support means,

conveyor systme means disposed on said top support surface for conveying signature bundles over said top surface,

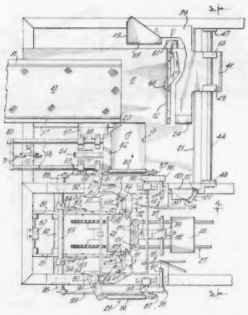
a bottom wrap presentation slot extending across said top surface, and

paper guide channel means for guiding lengths of said web precut to a given length by said knife extending from said second pair of rolls to said presentation slot.

3,881,298
CARTONING APPARATUS

Arthur J. Griner, Delray Beach, Fla.; Robert J. Albrecht, River Edge, N.J.; V. H. Hoagland, Fair Lawn, N.J., and Daniel Ignatuk, Morris Plains, N.J., assignors to Nabisco, Inc., New York, N.Y.

Filed May 28, 1974, Ser. No. 473,567
Int. Cl. B65b *35/50*
U.S. Cl. 53—164 **5 Claims**

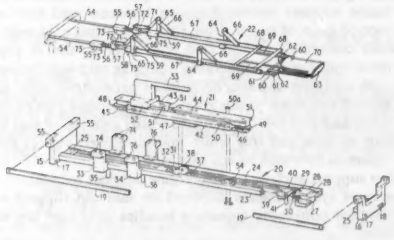


1. Cartoning apparatus comprising in combination an infeed conveyor carrying the articles to be cartoned, a stop member for positioning a column of articles delivered by the conveyor, a first transversely moving pusher for moving a group of articles from said column across a surface, a second surface beneath said first surface, means for depositing part of said group of articles onto said second surface, a longitudinally moving pusher for moving the articles of said group remaining on said first surface, and a second transversely moving pusher for simultaneously moving the aligned articles on both surfaces into a carton.

3,881,299
DEVICE FOR OPENING AND FILLING AN ENVELOPE

Frederick Douglas Clavell Bate, 155 Barkerhouse Rd., Nelson, England

Filed June 25, 1973, Ser. No. 373,417
Claims priority, application United Kingdom, June 29, 1972, 30398
Int. Cl. B65b *43/34*
U.S. Cl. 53—187 **19 Claims**

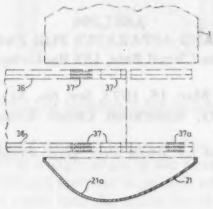


1. A device for opening and filling an envelope comprising at least two opening members adapted to lie in a substantially planar flat condition between two layers of plastics film forming a substantially flat envelope at least partly containing the members, carriage means on which said members are mounted for movement between said substantially flat condition and a spaced apart condition, means for moving said carriage means in a direction to dispose said opening members while in said flat condition in said envelope, means operable for moving said members apart to open at least the mouth of the envelope, an article pusher device on said carriage means, means for actuating said pusher device to push an article in said direction between the members when they are spaced apart and into the envelope, and means for moving said opening members and the pusher device towards one another when said pusher device is actuated so that as the pusher device pushes an article into the envelope the opening members draw the envelope over the article.

3,881,300
METHOD AND APPARATUS FOR SUPPLYING STEAM DURING THE LOCATION OF THREADED CAPS ON CONTAINERS

Einar Zetterberg, Professorsgatan 4B, Malmo, Sweden (21453)

Filed Aug. 24, 1973, Ser. No. 391,053
Claims priority, application Sweden, Feb. 25, 1972, 2321/72
Int. Cl. B65b *31/00*
U.S. Cl. 53—11 **8 Claims**



5. A method of closing containers such that a reduced pressure exists therein, the method comprising:

feeding open containers by means of a conveyor; locating a cap with respect to a corresponding container by guiding the cap between guide rails until the cap is engaged by its corresponding container;

providing a steam opening in one guide rail such that the opening faces the open container;

supplying steam outside the one guide rail and facing the open container;

streaming steam from the steam opening across the container and the cap at the position where the leading edges of the cap and container are engaged but while the trailing edges of the cap and container are vertically separated whereby air removed by the streaming steam is replaced by steam;

thereafter lowering said trailing edges into engagement while redirecting the steam from outside the other rail to the area between the guide rails; and finally,

preliminarily tightening the cap onto the corresponding container.

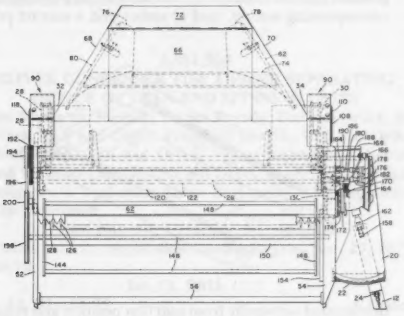
3,881,301
CROP HARVESTING MACHINE

Bobby Gene Sawyer, Ottumwa, Iowa, and Donald E. Burrough, West Bend, Wis., assignors to Deere & Company, Moline, Ill.

Filed July 3, 1972, Ser. No. 268,562
Int. Cl. A01d *45/02*
U.S. Cl. 56—14.4 **14 Claims**

1. A crop harvesting machine comprising: transversely extending frame means adapted to advance forwardly through

a field; transversely extending cutting means mounted forwardly on said frame means and adapted to cut a swath of crop material as said frame means is advanced forwardly; a generally fore-and-aft draft member extending forwardly from one side of the frame means along one lateral side of the cutting means; an upper and lower pair of parallel, transversely extending crop conditioning rolls mounted on said frame means above and rearwardly of said cutting means; crop transfer means for transferring cut crop material from said cutting means to said crop conditioning rolls, said rolls being operative to receive crop material therebetween and discharge said crop material rearwardly, the momentum of the

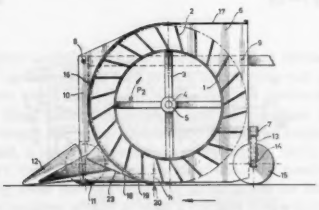


crop carrying it along an air borne path extending rearwardly from said rolls in spaced relation to the ground and thence downwardly to the ground; and a transversely spaced pair of ground-engaging wheels connected to said frame means and operative to support said frame means relative to the ground, at least one of said wheels being disposed rearwardly of and within the transverse extent of said conditioning rolls, and directly below and forwardly of the air borne path of crop material discharged from said rolls, whereby in operation of said crop harvesting machine crop material is discharged from said rolls directly over said one wheel and thence downwardly to the ground rearwardly of said one wheel.

3,881,302
PICKING MACHINE

Lolke Lokema, Delfzijl, Netherlands, assignor to Ter Borg & Mensingae's Machinenfabriek N.V., Appingedam, Netherlands

Filed June 14, 1974, Ser. No. 479,290
Int. Cl. A01d *45/22*
U.S. Cl. 56—130 **6 Claims**

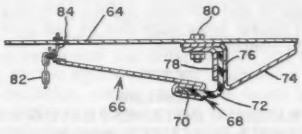


1. Machine for harvesting low growing crops, such as beans, said machine comprising a drum provided with a plurality of picking fingers, said drum having an axis transverse to the direction of travel, and being rotatable in a sense opposite the sense of rotation of the machine wheels, said drum cooperating with the lower edge, substantially at picking height, of a picking plate extending in curved shape at least at the front side partially around the drum, wherein the picking plate is provided at alternate locations with extensions, curved cylindrically around the picking drum contiguous with the cylindrically curved main picking plate body, these extended plate portions having edges substantially at the same level as the lowermost of the picking fingers, the distance between the centers of the extensions being chosen so as to correspond with the row spacing of the crop to be harvested.

3,881,303
ELASTOMERIC HINGE FOR A SWINGABLE AGRICULTURAL MACHINE ELEMENT

Jerry Lee Krafka; Bobby Gene Sawyer, and Ralph August Gerhardt, all of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed July 12, 1973, Ser. No. 378,729
Int. Cl. A01d *43/00*
U.S. Cl. 56—192 **10 Claims**



1. In an agricultural machine having an elongated sttationary member and an elongated swingable member having a longitudinal edge disposed adjacent to the stationary member, the combination therewith of improved hinge means connecting the swingable member to the stationary member for swinging about said edge and comprising: at least one elongated, normally flat, flexible element primarily made of elastomeric material; means connecting the flexible element to the stationary member substantially along the length of the element adjacent one longitudinal edge with the portion of one side of the element adjacent said edge flat against the stationary element; an elongated slot extending longitudinally along the longitudinal edge of the swingable member, the other longitudinal edge of the flexible element being tightly received in the slot to clamp the swingable member to the resilient element, whereby the flexible element bends about a longitudinal axis between its opposite edges to permit the swingable member to swing relative to the stationary member about said axis.

3,881,304
DUMPABLE GRASS CATCHER

Leslie C. Lempke, Bloomfield Hills, Mich., assignor to Homelawn Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 210,061, Dec. 20, 1971, abandoned. This application May 9, 1973, Ser. No. 358,538
Int. Cl. A01d *35/22*
U.S. Cl. 56—202 **62 Claims**

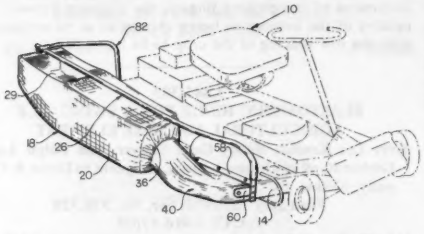
1. Apparatus for catching grass clippings or the like upon being discharged from a discharge opening of a power operated lawn mower comprising:

a container having an inlet opening at the front end for receiving the grass clippings and a storage space therewithin for accumulating the grass clippings and an outlet opening at the rear end for dumping the grass clippings; rigid support means for holding the container in fixed relationship to the mower in a substantially horizontal catching position; and

pivotal connecting means between the container and the mower enabling movement of the container between the catching position and a substantially vertical dumping position,

said pivotal connecting means being located outwardly beyond said mower and above said container adjacent the

rear end of said container whereby the rear end of said container is located a substantial distance upwardly above and beyond the mower and above the ground in the dumping position to enable the grass clippings to be discharged through the outlet opening at the rear end of



said container into a disposal container positioned thereunder,

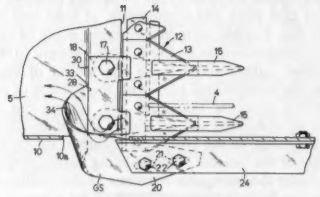
the weight of said container and the grass clippings contained therein being supported by said mower in the vertical dumping position.

3,881,305

CROP HANDLING IMPLEMENT HAVING A GUIDE SHIELD FOR CUT CROP MATERIAL

Donald E. Burrough, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.

Filed Dec. 19, 1973, Ser. No. 426,085
Int. Cl. A01d *55/02*
U.S. Cl. 56—257 **11 Claims**



1. A crop treating implement for travelling over a crop and including a transverse sickle assembly for severing the crop and also having a generally vertical side wall means located at one side of the implement, said sickle assembly extending through an opening in said side wall means, said implement also having a frame for supporting said side wall and said sickle assembly, and a guide shield extending generally transversely through said opening and having an end portion secured to said frame, said guide shield having an intermediate portion extending rearwardly and inwardly from said opening and terminating in a lower edge that snugly abuts against a rear side of said sickle assembly whereby said guide shield acts to shield said generally vertical wall means and permits crop material to be smoothly directed past side wall means.

3,881,306

MACHINE FOR FORMING A COMPACT STACK OF CROP MATERIAL

James R. Koop, Fowler; Gene R. Butler, Kingsburg; David L. Darnall, Fresno, and Lee D. Butler, Kingsburg, all of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 5, 1974, Ser. No. 458,267
Int. Cl. A01d *87/02*
U.S. Cl. 56—346 **7 Claims**

1. In a machine for forming a compact stack of crop material such as hay or the like, the combination comprising:

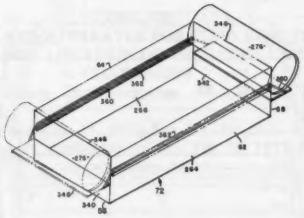
a mobile chassis adapted to move across a field;

a generally rectangular stack forming chamber mounted on said chassis;

means for picking up crop material from the field and progressively forming said crop material into a stack in said chamber;

packing means extending across said chamber between opposite sides thereof and moveable between opposite ends of said chamber to compact said crop material as said stack thereof is progressively formed in said chamber;

gate means mounted at each of said ends of said chamber, each of said gate means being moveable between a first position located adjacent to, and substantially closing said corresponding end of, said chamber and a second posi-



tion located outwardly from said first position and remote from, and at least partially opening said corresponding end of, said chamber;

means for moving said packing means between said ends of said chamber and at least partially past each of said ends so as to engage and move said one gate means at said corresponding end of said chamber from its first position to its second position and thereby achieve compaction of said crop material located adjacent said ends of said chamber;

and

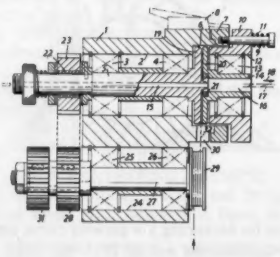
means for positioning each one of said gate means in said first position to substantially close said corresponding end of said chamber prior to each engagement of said one of said gate means by said packing means.

3,881,307

WINDING MATERIAL ON A CORE

Peter Rebbettes, Dorset, England, assignor to Aerostatic Limited, Poole, England

Filed Sept. 17, 1973, Ser. No. 397,759
Claims priority, application United Kingdom, Sept. 27, 1972, 44593/72
Int. Cl. B65h *81/08*
U.S. Cl. 57—18 **6 Claims**



1. A method, of applying a helical winding of filamentary material, to a core, comprising the steps of:

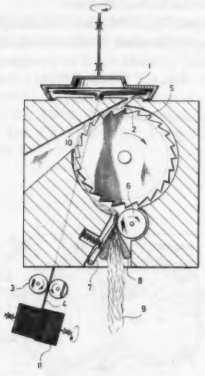
i. forming the filamentary winding material into a spiral of which the inner end is connected to the core and the outer end is continued by a bulk supply of the winding material;
ii. relatively moving the core axially through the spiral so as to cause the innermost turn of the spiral of winding material to be drawn into a helix about the core;
iii. simultaneously causing relative rotation of the innermost turn of the spiral with respect to the outermost turn of the spiral in the direction to cause the innermost turn to become smaller;
iv. feeding winding material to the outermost turn of the spiral at the same rate as it is removed from the innermost turn of the spiral.

3,881,308

SLIVER CONDENSER FOR A FIBER SEPARATING DEVICE OF OPEN-END SPINNING UNITS

Milan Marsalek, Nachod; Vaclav Brynda, Usti nad Orlici; Jan Junek, Usti nad Orlici; Frantisek Hortlik, Usti nad Orlici; Josef Ripka, Usti nad Orlici; Vaclav Vobornik, Letohrad, and Vladimir Ohlidal, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Nov. 14, 1973, Ser. No. 415,808
Claims priority, application Czechoslovakia, Nov. 29, 1972, 8120/72
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.95 **6 Claims**



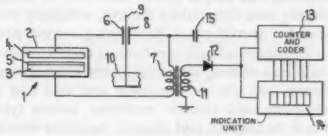
1. A sliver condenser for a fiber separating device of an open-end spinning unit, comprising a combing-out cylinder and a sliver supplying mechanism associated therewith comprising a feed roller cooperating with a pressure member between which the sliver discharged from the condenser is compressed, a sliver condenser duct having an intake and an outlet port, the cross-sectional area of the duct continuously diminishing from the intake to the outlet port, the heights of duct cross-sections within at least a portion of the duct length parallel with the feed roller axis being greater than the maximum widths of the respective cross-sections perpendicular to the last-mentioned heights, so that at least within said portion of the duct length the two opposite duct walls are wider than the two other opposite duct walls, within one and the same duct cross-section the cross-sectional width gradually varying so that the maximum width of the cross-section is adjacent at least one of the opposite duct walls.

3,881,309

ELECTRONIC TIMEPIECE

Rene Jenni, Biel, and Karl Adler, Grenchen, both of Switzerland, assignors to Biviator S.A., Grenchen, Switzerland

Filed Mar. 5, 1974, Ser. No. 448,281
Claims priority, application Switzerland, Mar. 13, 1973, 3613/73
Int. Cl. G04b *1/00*
U.S. Cl. 58—23 V **4 Claims**



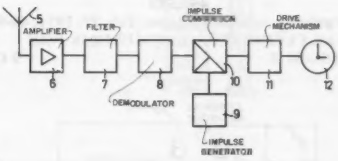
1. An electronic timepiece such as a watch comprising liquid-crystal time indicating means, a single isotope direct voltage source, a mechanical resonator regulating the time-keeping function of said timepiece, an electrostatic driving system for said resonator, a driving circuit interconnecting said driving system with said voltage source, said resonator generating electric signals which are synchronous with the resonator oscillation, voltage transducing means having its input connected to said driving circuit, a counting and coding circuit connected at a control input to said driving circuit and at an output to said indicating means, the output of said transducing means being connected to supply operating potential to a power input of said counting and coding circuit and to said indicating means for energizing them, energy from said signals being employed both as a control input signal to said counting and coding circuit and as an operating voltage for said counting and coding circuit and for said indicating means.

3,881,310

CLOCK ADAPTED TO BE SYNCHRONIZED BY ALTERNATING CURRENT IN A WIRELESS MANNER

Erich Gerum, and Alfred Meisner, both of Nuremberg, Germany, assignors to Diehl, Nuremberg, Germany

Continuation-in-part of Ser. No. 230,326, Feb. 29, 1972, abandoned. This application July 16, 1973, Ser. No. 379,563
Claims priority, application Germany, Mar. 2, 1971, 2109707; Mar. 2, 1971, 2109705
Int. Cl. G04b *1/00*
U.S. Cl. 58—35 W **12 Claims**



1. In combination with an electric clock and a transmitter, said clock having therein an electromagnetically operated mechanical oscillator with a predetermined natural frequency which is a selected whole number times the rated frequency of an alternating current network, said electromagnetically operated mechanical oscillator including actuating coil means therein, said transmitter that generates a carrier wave being installed at a location remote from the electric clock wherein said mechanical oscillator is provided, aerial means respectively being provided for effective relationship between said transmitter and said clock, modulating means in the transmitter, said transmitter being adapted to be connected to said network and including means operable to transmit said carrier

wave at a higher frequency greater than that of audible sound and modulated by said modulating means effective with said network at a lower frequency which is said selected whole number times the frequency of the network, a receiver at the clock having an input end and an output end, a demodulating means in the receiver, said receiver being adapted to receive said modulated carrier wave at said input end and including amplifier means operable to amplify and connected serially with said demodulating means to demodulate the wave to develop first pulses at said lower frequency at said output end, means connecting said output end of said receiver to said coil means to supply said first pulses thereto, a battery powered electric oscillator at said clock developing second pulses at said natural frequency of said mechanical oscillator and connected to said coil means, semi-conductor control means in circuit between said electric oscillator and said coil means normally disabling said electric oscillator, means lying between said coil means and said electric oscillator sensitive to the supply of an impulse signal in response to deviation of frequency of the network by a predetermined amount from the rated frequency thereof to enable said electric oscillator to operate, and comparing means comparing the frequency of said first pulses to the said natural frequency of said mechanical oscillator connected therewith and connected to supply a said impulse signal to said semi-conductor control means in response to deviation of said network frequency by a predetermined amount from the said rated frequency thereof, said receiver at the output end including a first transistor having the emitter-collector path in series with said actuating coil means and the base connected to receive said first pulses; said electric oscillator comprising a second transistor having the emitter-collector path in series with a portion of said actuating coil means and said battery; said semi-conductor control means comprising a third transistor having the remainder of said actuating coil means connected between the base and the emitter thereof, the collector of said third transistor being connected to the base of said second transistor and via a capacitor to the emitter of said third transistor and via a resistor to one side of said battery, said mechanical oscillator having magnet means linking said remainder of said actuating coil means to develop pulses therein during oscillation of the mechanical oscillator.

3,881,311

DRIVING ARRANGEMENT FOR PASSIVE TIME INDICATING DEVICES

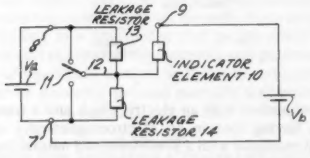
Tetsuro Hama, and Izuhiko Nishimura, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 232,461, Feb. 28, 1972, Pat. No. 3,797,225. This application Mar. 19, 1974, Ser. No. 452,588

Claims priority, application Japan, Feb. 27, 1971, 46-9804

Int. Cl. G04b *19/30;* **H02j** *3/10;* **H05b** *39/02*

U.S. Cl. 58—50 R **9 Claims**



1. An electronic timepiece comprising oscillator means for producing a high frequency time standard signal; divider circuit means for producing an intermediate frequency signal and low frequency timing signals in response to said high frequency time standard signal; decoder means for producing display actuation signals in response to said timing signals; driving circuit means coupled to said decoder means and including double throw-type switching means connected for selective disposition in one of first and second switching modes in response to display actuation signals; liquid crystal display means defining passive indication means and including at least four digits for the visual indication of time, each of said digits of said display including seven segmented electrodes oriented in a seven-bar display and a common electrode, corresponding segments of said segmented electrodes being electrically connected together, one of said driving circuit means being connected to each of said commonly connected segments; and digit timing pulse generator means respectively connected to each of said common electrodes for sequentially applying said first potential to each of said common electrodes, said double throw type switching means having first and second input terminals and an output terminal for selective placement in either of said first switching mode at which said first input and said output terminals are coupled and said second switching mode at which said second input and said output terminals are coupled, each said switching means output terminal being connected to one group of corresponding segmented electrodes; and means for applying a second and third potentials to said first and second switching means input terminals, respectively, said potentials being selected to have a value such that the difference between said first and second potentials is sufficient to actuate said passive indication means to provide a visual indication, and the difference between said first and third potentials is less than the threshold voltage of said passive indication means at which such visual indication is first produced.

3,881,312

MECHANICAL WATCH MOVEMENT

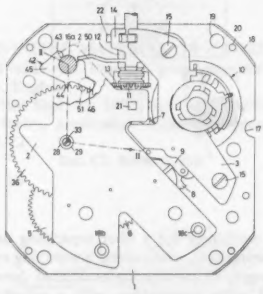
Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S.A., Bettlach, Switzerland

Filed Apr. 30, 1974, Ser. No. 465,663

Claims priority, application Switzerland, May 11, 1973, 6730/73

Int. Cl. G04b *33/00*

U.S. Cl. 58—59 **8 Claims**



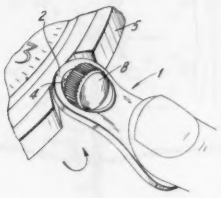
1. A mechanical watch movement comprising a base-plate and at least one bridge fastened to the base-plate by pillars, wherein the base-plate, viewed in plan, is in the shape of a square having its corners cut off by a circle concentric with the square, and the other parts of the movement are fitted within an imaginary cylindrical surface tangent to the sides of the square.

3,881,313

BATTERY DISCHARGE GUARD FOR ELECTRIC WATCH

Edward Kaulins, New Milford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sept. 3, 1974, Ser. No. 502,998
Int. Cl. G04b 43/00; G04c 3/00; H01h 35/00
U.S. Cl. 58—105 5 Claims



1. A battery discharge guard for an electric watch of the type having a depressible external actuator for closing an internal circuit or connecting the battery and having a stem slidable within a pendant and an enlarged crown,

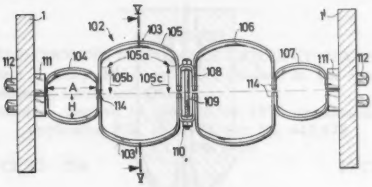
said guard comprising a first pendant-enclosing portion of stretchable material of sufficient thickness to hold the stem in an extended non-operative position, and a second portion connected to the pendant-enclosing portion for stretching it and pulling it over the crown of the actuator.

3,881,314

POWER TRANSMISSION CHAIN

Kurt Hennig, and Hans-Peter Schmidberger, both of Munich, Germany, assignors to Kurt Hennig, Munich, Germany

Filed Aug. 15, 1973, Ser. No. 388,401
Claims priority, application Germany, Aug. 31, 1972, 2242898; Nov. 23, 1972, 2257511; Nov. 4, 1972, 2254086
Int. Cl. F16l 3/00; F16g 13/16
U.S. Cl. 59—78.1 8 Claims



1. A connecting web, for a power transmission channel having at least two chain belts transversely connected by a plurality of such webs, said connecting web

a. having greatly improved stiffness for its weight,

b. being formed of sheet metal strips each having a width substantially greater than its thickness, the width of each strip extending longitudinally of the channel, and

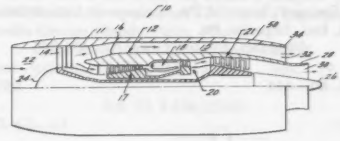
c. consisting of two superimposed parts, each part being composed of a plurality of U-shaped sections with the legs of adjacent sections secured together in flat contact, the legs of each U-shaped section of one part being opposed to the legs of a corresponding U-shaped section of the other part, whereby said corresponding sections form an opening to receive a power supply line, and each part having a bracket interposed between two adjacent U-shaped sections and aligned with the bracket on the other part, for receiving a screw to hold the two parts together.

3,881,315

FAN DUCT FLOW DEFLECTOR

Paul J. Hess, Cincinnati, and Hans P. Mehr, Mason, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 19, 1973, Ser. No. 342,767
Int. Cl. F02k 3/06
U.S. Cl. 60—226 R 10 Claims



1. In a gas turbine engine of the turbofan variety including a core engine having a core exhaust nozzle and a fan duct having a fan exhaust nozzle disposed to the radial exterior of the core nozzle, and wherein the fan flow from the fan nozzle substantially encircles the core flow from the core nozzle, the improvement comprising:

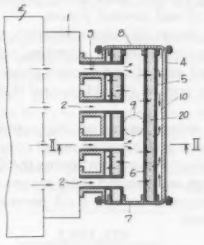
means disposed between the core nozzle and the fan nozzle for turning the fan flow radially outwardly at the discharge plane of the core nozzle to reduce back pressure on the core flow.

3,881,316

EXHAUST GAS PURIFYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Tsuchio Bunda, Okazaki; Itaru Niimi, Nagoya; Yasuhisa Kaneko, and Fumiyoshi Noda, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 209,698, Dec. 20, 1971, abandoned. This application May 14, 1973, Ser. No. 360,078
Claims priority, application Japan, Apr. 16, 1971, 46-24327
Int. Cl. F01n 3/14
U.S. Cl. 60—302 8 Claims



1. An exhaust gas purifying device for an internal combustion engine, comprising:

a converter body connected to an exhaust outlet passage,

a major diameter cylindrical member and a minor diameter cylindrical member comprising an air permeable material, concentrically arranged within said converter body, a duct for directly introducing exhaust gases into the bore of said minor diameter cylindrical member from an internal combustion engine,

a catalyst material for effecting exhaust gas purification located in the space between the walls of said major and minor diameter cylindrical members,

substantially horizontal partition plates located in the space between the walls of said major and minor diameter cylindrical members, dividing the catalyst material into an upper catalyst portion and a lower catalyst portion, for

preventing the weight of the upper catalyst portion from bearing upon the lower catalyst portion,

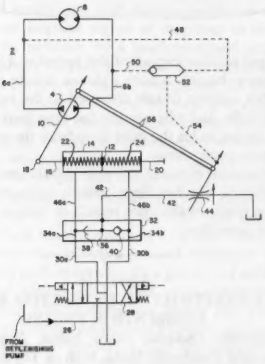
and the portions of the major diameter cylindrical member immediately below said partition plates, are non-permeable to exhaust gases.

3,881,317

CONTROL SYSTEM FOR VARIABLE DISPLACEMENT HYDRAULIC PUMP

Jon R. Swoager, Imperial, Pa., assignor to Automation Equipment, Inc., Imperial, Pa.

Filed Oct. 25, 1973, Ser. No. 409,746
Int. Cl. F16h *39/46*
U.S. Cl. 60—444 **6 Claims**



1. In a control system for a hydraulic transmission having a pump for supplying fluid under pressure to a motor through a closed circuit, said control system being in selective communication with a fluid drain and including a control piston operably connected to the cam plate of said pump, the improvement comprising:

first valve means having an inlet and an outlet for selectively introducing control fluid under pressure to one or the other side of said control piston;

flow control means in communication with said outlet of said first valve means for directing said control fluid to said selected side of said control piston and providing an outlet for a portion of said control fluid;

and

second valve means having an inlet connected to said flow control means outlet and an outlet connected to said fluid drain for selectively proportioning the flow of said control fluid through said second valve means outlet to said fluid drain in response to said fluid pressure present in said closed circuit.

3,881,318

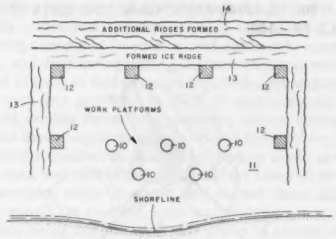
ARCTIC BARRIER FORMATION

David E. Galloway, Simonton, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Aug. 27, 1973, Ser. No. 392,146
Int. Cl. E02b *3/00*
U.S. Cl. 61—1 R **3 Claims**

1. A method for forming a protective barrier for offshore facilities in frigid regions comprising the steps of:

constructing multiple artificial islands at spaced apart distances from each other along the seaward edge of the area in which said facilities are located, each artificial island comprising materials anchored to the sea floor and extending to near sea level, spacing between each artificial island being preselected relative to the depth of water in which said island structures are located to induce grounding of ice formations such as pressure ridges and ice islands; and



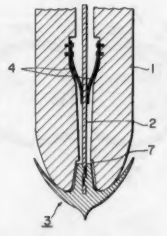
creating a mass of grounded ice formations to prevent encroachment of ice formations upon said offshore facilities, said spacing being sufficiently narrow to prevent ice formations of a magnitude the offshore facilities are incapable of resisting from passing between said islands.

3,881,319

APPARATUS FOR DRIVING BOARD DRAINS UNDERGROUND

Kotaro Katagiri, Yokohama; Masyuki Saito, Kodaira; Jiro Saito, Tokyo; Kiyoshige Nishibayashi, Niiza, and Tatsuyuki Matsuo, Tokorozawa, all of Japan, assignors to Shinetsu Chemical Company, Tokyo and Ohbayashi-Gumi, Ltd., Osaka, both of, Japan

Filed Oct. 3, 1973, Ser. No. 403,069
Claims priority, application Japan, Oct. 5, 1972, 47-100121
Int. Cl. E02b *11/00*
U.S. Cl. 61—11 **8 Claims**

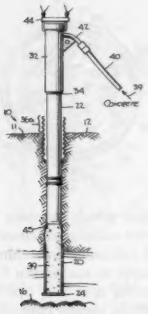


1. Apparatus for insertion of board drains into soft clay soils comprising a board drain, a hollow mandrel and a capping means, said hollow mandrel having at least one open end, said capping means having means for securing said board drain thereonto, said capping means surrounding the open end of said mandrel to protect it from entry of foreign matter when the mandrel, capping means and board drain are driven into the soil, and said capping means being provided with two diverging edged wings on opposing sides, said wings extending outwardly from the lower end of said hollow mandrel so as to anchor said capping means and said board drain in the soil by cutting the soil when said hollow mandrel is pulled up.

3,881,320
PILE INSTALLATION IN SUBMERGED BEARING STRATA

George J. Gendron, Houston, Tex., assignor to Raymond International Inc., Houston, Tex.

Filed June 27, 1973, Ser. No. 373,977
Int. Cl. E02d 5/34, 5/72
U.S. Cl. 61—53.64 17 Claims

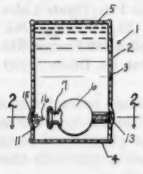


1. A method of installing a pile in a bearing stratum which underlies a softer non-supporting stratum of earth, said method comprising the steps of detachably fitting an elongated, hollow, tubular, closed bottom overboot over the lower end of an elongated drive member capable of transmitting driving forces applied to its upper end down to the lower end of said overboot, driving said overboot down through the earth and into said bearing stratum by application of said driving forces to the upper end of said drive member until said overboot reaches a depth in said bearing stratum sufficient to produce a predetermined maximum driving resistance but less than the length of said overboot so that at least a portion of the upper end of said overboot extends up beyond said bearing stratum and into said non-supporting stratum, thereafter removing said drive member from said overboot and installing a load carrying column to extend from within said overboot up through said softer stratum.

3,881,321
SELF-COOLING DISPOSABLE LIQUID CONTAINER

William T. Riley, Harrison, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Substitute for Ser. No. 13,290, Feb. 24, 1970, abandoned. This application Feb. 19, 1974, Ser. No. 443,679
Int. Cl. F25d 3/10
U.S. Cl. 62—294 17 Claims

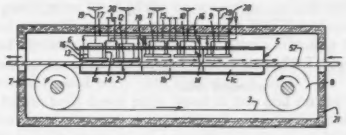


1. A self-cooling disposable beverage container comprising in combination:
- a disposable beverage container for containing a beverage;
- a refrigerant chamber disposed within said container;
- pressurized refrigerant fluid, said fluid being contained in said refrigerant chamber and being a mixture of carbon dioxide and a material selected from the group consisting of iso-butane, nitrous oxide, nitrogen, propane and mixtures thereof; and
- means for puncturing said refrigerant chamber to permit said pressurized refrigerant fluid to escape through the beverage.

3,881,322
METHOD OF COOLING PRODUCTS

Raymond Le Diouron, Grenoble, France, assignor to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des procedes George Claude, Paris, France

Filed Nov. 10, 1972, Ser. No. 305,283
Claims priority, application France, Nov. 19, 1971, 71.41572
Int. Cl. F25d 13/06
U.S. Cl. 62—63 7 Claims



1. A method of cooling a body, comprising;
- a. displacing the body to be cooled inside an elongated cooling zone, from the inlet to the outlet thereof, in a longitudinal direction with respect to said cooling zone,
- b. introducing into said cooling zone a pressurized gaseous medium, and causing at least part of said introduced gaseous medium to circulate in direct contact with said body, towards said inlet, in said longitudinal direction, as a countercurrent flow with respect to the displacement direction of said body,
- c. pressurizing a refrigerant liquid to a pressure higher than the ambient pressure outside said cooling zone; vaporizing said pressurized refrigerant liquid in at least a longitudinal heat exchanger, said heat exchanger being in heat exchange relationship with said cooling zone, and in direct contact with said countercurrent flow; obtaining said pressurized gaseous medium from at least part of the vaporized refrigerant liquid issuing from said heat exchanger,
- d. in at least a longitudinal flow path section of heat transfer, extending along said heat exchanger, constraining said countercurrent flow into a substantially turbulent and longitudinal gaseous stream, closely enveloping at least part of the body to be cooled, whereby said gaseous medium acts in at least said longitudinal flow path section as a heat transfer medium from said body to said heat exchanger and has a substantially constant low temperature along said longitudinal flow path section.

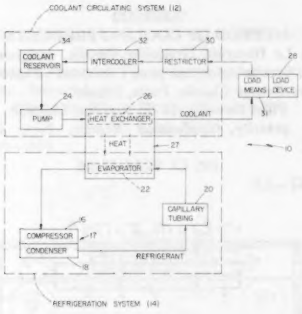
3,881,323
VISCOSITY REGULATED COOLING SYSTEM

John H. Porter, Colchester Point, Vt., assignor to Ladd Research Industries, Inc., Burlington, Vt.

Filed May 24, 1973, Ser. No. 363,564
Int. Cl. F25d 17/00
U.S. Cl. 62—216 4 Claims

1. A viscosity regulated cooling system for cooling a load device, comprising
- a closed coolant circulating system adapted to contain a coolant whose viscosity varies inversely with its temperature and having
- coolant circulating means for supplying and circulating coolant through said closed system,
- refrigeration means for cooling said coolant
- load means for bringing said coolant after being cooled by said refrigeration means into heat absorbing relationship with the load device, and

flow restriction means downstream of said load means and upstream of said circulating means for limiting flow of said coolant responsive to its viscosity as established by said load means, and termperature normalizing means

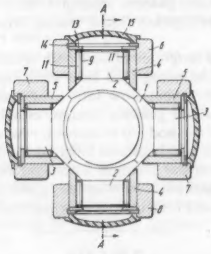


connected downstream of said flow restriction means for causing the temperature of said coolant to approach an ambient temperature after passing through said load means.

3,881,324
UNIVERSAL JOINT

Sobhy Labib Girquis, Troisdorf, Germany, assignor to Uni-Cardan AG, Lohmar, Rhine, Germany

Filed May 22, 1973, Ser. No. 362,785
Claims priority, application Germany, May 26, 1972, 2224594
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 A **13 Claims**

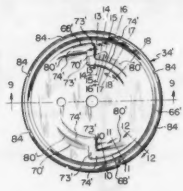


1. A universal joint comprising a cross member having a body portion and pins thereon in a cruciform arrangement, said body portion having a beveled surface forming a valve seat surface adjacent each of said pins, a bearing housing on each of said pins and bearing element means within the housings, said bearing housings each comprising a tubular member having an end portion of spherical configuration supported and adapted to smoothly fit on said beveled surface of said cross member body portion, a pair of yokes each having a pair of yoke arms, each yoke arm having a bore therethrough to receive a bearing housing therein, and means in each said yoke arm bore for positioning axially a said bearing housing therein to connect pivotally said yokes to said cross member pins.

3,881,325
OVERRIDE CLUTCH

Laszlo N. Repay, Chagrin Falls, and Thomas A. Young, Burton, both of Ohio, assignors to Tenna Corporation, Cleveland, Ohio

Filed Sept. 21, 1973, Ser. No. 399,301
Int. Cl. F16d *3/56*
U.S. Cl. 64—29 **19 Claims**



1. In a mechanism which includes a drive motor and an actuating member for causing actuation of an associated operative element, and releasable clutching means for clutching said actuating member to said motor for causing actuation of said actuating member and thus operation of the operative element, said clutching means comprising a rotatable clutch member for clutching the power of the motor to the actuating member, abutment means on said clutch member and on said actuating member, said abutment means on said clutch member being adapted for abutting engagement with said abutment means on said actuating member for causing rotation of the latter during energization of the motor, ramp means coacting with said abutment means on one of said members for preventing sudden movement and undesirable sound between said abutment means in the event that the driving connection between the clutch member and said actuating member is released when the stress between the abutment means results in an overload causing one of the abutment means to override the confronting abutment means, and said abutment means on the other of said members comprising a rollable element and wherein said motor is of reversible drive type, said members having a coincident axis of rotation, said abutment means on one of said members comprising a plurality of abutments which are located at predetermined different distances from the axis of rotation of said members, certain of said abutments being operative during rotation of said one member in one rotary direction, while the other of said abutments are operative during rotation of said one member in the opposite rotary direction.

3,881,326
DEVICE FOR AND METHOD OF MAKING A KNITTED BAND HAVING A SPIRAL ZIPPER INCORPORATED THEREIN

Alain Bourgeois, Le Sejalat, France, assignor to Elastelle Paul Fontanille & Fils, Le Puy, Haute-Loire, France

Filed Feb. 22, 1973, Ser. No. 334,861
Claims priority, application France, Mar. 1, 1972, 72.07065
Int. Cl. D04b *23/00*
U.S. Cl. 66—86 R **6 Claims**

1. A method of making a knitted band having a zipper spiral securely incorporated into a longitudinal edge thereof, said zipper spiral having a plurality of turns with a plurality of hooking means extending outwardly therefrom, said method comprising the steps of:

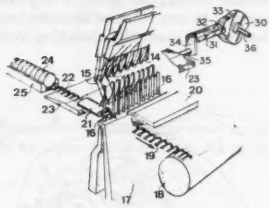
warp-knitting said band with stitch threads and weft threads in longitudinal columns of stitches interconnected with each other, said stitch threads and weft threads being guided as a layer to said band during the knitting thereof;

placing said zipper spiral adjacent the longitudinal exterior edge of said band during the knitting of said band with said hooking means being directed away therefrom, the longitudinal axis of said zipper spiral being essentially

perpendicular to the plane of said layer of stitch and weft threads and essentially aligned with the plane of said bend;

passing said zipper spiral through a guide tube positioned immediately forward of and axially perpendicular to said layer of threads;

moving said zipper spiral longitudinally through said guide tube during the knitting of said band in accordance with the formation cycle of said stitches; and



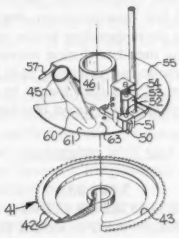
simultaneously passing each of said turns transversely through at least one column of stitches being formed on the longitudinal exterior edge of said band by moving said guide tube in a uniform, essentially rectilinear cyclic manner perpendicular to its longitudinal axis and parallel with the plane of said band, said guide tube moving said zipper spiral in a direction transverse to and in the same plane with the band being formed so as to pass at least one of said threads on both sides of each turn of said zipper spiral to secure each turn in at least one stitch of said bend at its longitudinal exterior edge.

3,881,327

YARN CUTTER FOR COARSE GAUGE KNITTING MACHINE

Peter A. Mahler, High Point, N.C., assignor to H. E. Crawford Co., Inc., Kernersville, N.C.

Filed Aug. 8, 1974, Ser. No. 495,577
Int. Cl. D04b *15/61*
U.S. Cl. 66—134 **6 Claims**



1. In a circular knitting machine including a needle cylinder supporting a circle of vertically movable needles, means for selectively rotating and reciprocating said needle cylinder, a yarn feeding station with feed fingers movable between active and inactive positions for selectively feeding body yarns to the needles, an elastic yarn feed finger positioned in spaced apart relationship and in advance of said body yarn feeding station, and a vertical drive shaft movable with said needle cylinder and with its lower end supported in the upper end of said circle of needles, the combination therewith of means for cutting the ends of yarns introduced and removed by said body yarn feed fingers and said elastic yarn feed finger, said cutting means comprising

a. a single-piece circular cutter fixed on the lower end of said vertical drive shaft for rotary and reciprocatory movement with said needle cylinder, said circular cutter including teeth around the outer periphery and having an annular recess in its upper surface, the lower surface of said circular cutter tapering inwardly and downwardly from the teeth on the outer periphery to permit the smooth passage of yarns therebeneath,

b. a circular dial plate supported in non-rotating position and in said annular recess in said circular cutter with the upper surface of said dial plate extending above the upper level of said circular cutter,

c. a cutter blade supported on said dial plate and substantially opposite said body yarn feed station, said cutter blade contacting the upper surface of said peripheral teeth on said circular cutter to sever yarns introduced and removed at said body yarn feeding station and said elastic yarn feed finger,

d. a guard plate fixed to the upper surface of said dial plate and extending outwardly over said peripheral teeth on said circular cutter, said guard plate extending from a position in advance of said elastic yarn feed finger and around to said body yarn feed station, and

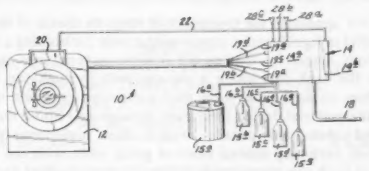
e. a fabric hold-down plate fixed at one end on the end of said guard plate adjacent said body yarn feed station, said fabric hold-down plate extending in front of said body yarn feed station and downwardly to hold the fabric down on the needles as the needles move past said body yarn feed station.

3,881,328

ELECTRONIC DETERGENT DISPENSING SYSTEM

David L. Kleimola; Marcus I. Nystuen, both of St. Paul, and David L. Nystuen, Bloomington, all of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Division of Ser. No. 210,669, Dec. 22, 1971, abandoned. This application Feb. 23, 1973, Ser. No. 335,136
Int. Cl. D06f *33/02, 39/02*
U.S. Cl. 68—12 R **2 Claims**



1. A system for supplying precisely controlled amounts of liquid product to a washing machine having a main water supply controlled in a predetermined machine cycle, comprising:

a. a carrier liquid conduit in addition to the main water supply connected to the washing machine, for conveying carrier liquid thereto;

b. electrically actuable valve means located in said carrier liquid conduit and effective when actuated to enable the continuous flow of carrier liquid to the machine therethrough;

c. venturi-aspirator means located in said carrier liquid conduit for conduction of the carrier liquid under the control of said valve means;

d. a receptacle for containing a liquid product to be injected into said machine;

a liquid product conduit connecting said receptacle to said venturi-aspirator means so that upon flow of carrier liquid therethrough the liquid product is drawn from said receptacle and injected into the carrier liquid flow, whereby the amount of liquid product supplied to the washing

machine is determined by the duration of carrier liquid flow in the carrier liquid conduit;

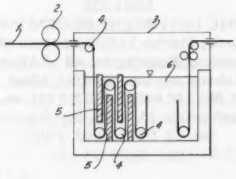
f. a cycle controlling timing device associated with the washing machine for providing an electrical triggering signal synchronized with a step of the machine cycle; and g. electrical control apparatus connected to receive said electrical triggering signal from said cycle controlling timing device, including an electrical timer connected to said valve means, and operative upon initiation of said electrical triggering signal to produce first and second control signals spaced by a predetermined delay interval, said apparatus including means actuating and maintaining actuated said valve means in response to said first control signal and deactuating said valve means in response to said second control signal, so that the amount of said liquid product supplied to said machine as a result of each triggering signal is a function of the duration of said delay interval, regardless of further continuance of said triggering signal.

3,881,329

APPARATUS FOR TREATMENT OF FLEXIBLE MATERIALS IN LIQUID MEDIA

Helmar Passler; Rudolf Hanke, and Adolf Heger, all of Dresden, Germany, assignors to VEB Textilkombinat Cottbus, Cottbus, Germany

Filed June 28, 1973, Ser. No. 374,545
Int. Cl. B05c *3/152*
U.S. Cl. 68—175 **5 Claims**



1. An apparatus for treatment of strips or sheets of flexible material in liquid media, comprising a tank for holding a liquid medium; means for feeding the flexible material into and out from the tank and along a zig-zag path through the liquid medium in said tank such that successive portions of the flexible material during their path through said liquid medium extend substantially parallel to each other, said means including two vertically spaced rows of guide rolls, with the guide rolls in each row transversely spaced from each other and with the guide rolls in one row transversely spaced with respect to the guide rolls in the other row; a plurality of successive substantially parallel and transversely spaced baffle walls, successive baffle walls respectively extending from opposite sides toward the guide rolls of one and the other row between successive portions of the flexible material guided by said guide rolls; and a plurality of rod-shaped projections fixed in staggered relationship along successive baffle walls and projecting with portions thereof into the path of the material guided by said guide rolls to constrain the material to move between successive baffle walls along as undulating path.

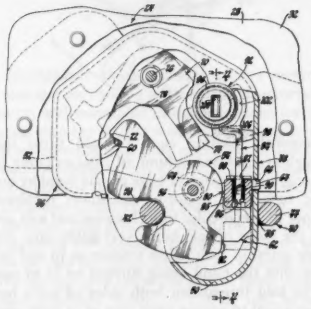
3,881,330

CLOSURE LATCH ASSEMBLY

Howard D. Hester, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1974, Ser. No. 462,885
Int. Cl. E05b *63/00*
U.S. Cl. 70—1.5 **3 Claims**

1. In a closure latch assembly including a frame, latch bolt means supported on said frame for movement between a latched position and an unlatched position, detent means supported on said frame for movement between a detenting position engaging said latch bolt means in the latched position of the latter and maintaining said latch bolt means in the latched position and a releasing position remote from said latch bolt means permitting movement of the latter to the releasing position, the combination comprising, a cam member, means supporting said cam member on said frame for movement in a first mode between a first position remote from said detent lever and a second position engaging said detent lever and moving the latter to the releasing position in response to a predetermined actuating force input and for independent movement in a second mode in response to a force input corresponding to one mode of unauthorized manipulation of said closure latch assembly, a blocking member, means



supporting said blocking member on said frame for movement between a non-blocking position remote from said latch bolt means and a blocking position preventing movement of said latch bolt means to the unlatchced position, means continuously urging said blocking member to the blocking position, link means attached to said blocking member and movable as a unit therewith, and link retainer means connected to said link means and to said cam member for movement as a unit with the latter, said link retainer means maintaining said link means in a position corresponding to the non-blocking position of said blocking member during movement of said cam means in the first mode but releasing said link means in response to movement of said cam means in the second mode thereby to permit movement of said blocking member to the blocking position.

3,881,331

LOCKING DEVICE INCORPORATING A LOCK CASE, AN ESCUTCHEON AND A DOOR HANDLE

Erik Rudolf Tranberg, and Nils Kaj Gunnar Rosenqvist, both of Eskilstuna, Sweden, assignors to GKN-Stenman AB, Eskilstuna, Sweden

Filed Oct. 2, 1973, Ser. No. 402,688
Int. Cl. E05b *59/00, 13/00*
U.S. Cl. 70—107 **11 Claims**

1. A locking device comprising:

a lock case, an escutcheon housing and a door handle;

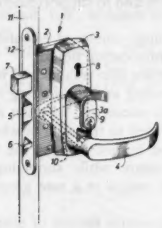
the lock case including therein a spring bolt operable by a sectioned bar, said sectioned bar in a cooperative arrangement with the door handle;

a cylinder lock mechanism to effectuate a locking of said spring bolt, said lock mechanism being substantially contained in the escutcheon housing;

a dead lock mechanism including a dead bolt latchable

separately from the spring bolt; and

means in said escutcheon housing cooperating with said



lock cylinder for releasing the door handle from the sectioned bar upon the latching of the spring bolt.

3,881,332

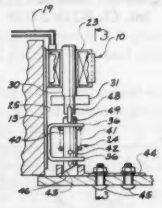
ELECTRIC LOCK ASSEMBLY

Howard T. Ballew, Sr., Rt. 3, P.O. Box 271; Ellick E. Burton, Rt. 3, and Charles C. Lancaster, 400 S. Main St. c/o Missouri, Pacific Railroad, all of Poplar Bluff, Mo. 63901

Filed May 1, 1973, Ser. No. 356,187

Int. Cl. E05b *47/04, 65/14*

U.S. Cl. 70—282 **1 Claim**



1. An interiorly mounted, electrically operated lock assembly for a carrier vehicle to prevent theft from the vehicle between loading stations comprising:

a. framing means defining an opening to the vehicle interior,

b. door means operatively closing said opening,

c. an electric lock mounted to one of said means and lockingly engageable with the other of said means the lock including:

1. solenoid means carried by said one means and including a movable core member having a longitudinal axis of movement and a connection means,

2. bolt means carried by said one means and including a bolt member engageable with said other means said bolt member having a longitudinal axis of movement and a connection means, and

3. link means including spaced end portions operatively interconnecting said solenoid core member and said bolt member between said connection means for longitudinal movement of said bolt member by said core member, said spaced end portions permitting relative, transverse translational movement of said bolt member and said core member connection means substantially without transfer of transverse shear forces to said solenoid core member from said bolt member, and

d. an electric energy supply means selectively connectible with the solenoid means for actuating said solenoid means and inducing longitudinal movement into the bolt member said supply means including:

1. a remote conventional 110 volt alternating current power supply outlet at the loading station, and

2. an extension cord extending between the outlet and the carrier vehicle.

3,881,333

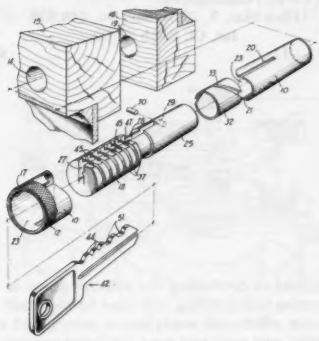
LOCK FOR WINDOW SASHES

William Christmas, 6720 Glenmoor Dr., Charlotte, N.C. 28214

Filed Aug. 28, 1974, Ser. No. 501,046

Int. Cl. E05b *27/00*

U.S. Cl. 70—364 R **10 Claims**



1. A rotary bolt lock comprising a sleeve having an interior cylindrical wall with at least one indentation formed therein; a bolt slidably disposed within said sleeve; camming means for rotating said bolt as it moves longitudinally in said sleeve; and a tumbler coupled with said bolt, said tumbler including a cylindrical body disposed within said sleeve and defining a keyway having an entrance at one end thereof and an opening along the cylindrical periphery thereof, and a set of springs mounted to said body overlaying said keyway opening with a plurality of said springs having an end projecting from the cylindrical periphery of said tumbler body for movement out of and into said sleeve indentation upon insertion and removal of a key into said keyway and into and out of engagement with the portions of said springs overlaying said keyway opening.

3,881,334

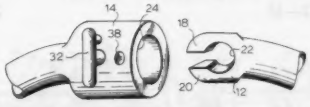
STORAGE RING WITH INTEGRAL CLOSURE

Porter C. Wilson, Box 11010, Tucson, Ariz. 85734

Filed Jan. 3, 1974, Ser. No. 430,577

Int. Cl. A44b *15/00, 11/00*

U.S. Cl. 70—457 **4 Claims**



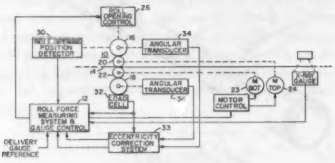
1. Apparatus comprising a unitary flexible member having first and second ends and closure means detachably connecting said ends, said closure means comprising a hollow socket on one of said ends and a plug on the other of said ends, said plug having a pair of lips defining a narrow slot, an enlarged recess provided in said plug in communication with said slot, said socket having a bore for the reception of said plug, a locking rod extending transversely across said bore and in one position thereof being configured to pass through said slot into said recess in said plug, means to enable rotation of said locking rod to a position preventing removal of said rod from said recess, said locking rod extending outwardly from two sides of the exterior periphery of said socket, whereby said locking rod can move perpendicular to the longitudinal axis of the bore in said socket to a position preventing rotation of said locking

rod, and a latch to maintain said locking rod in said position preventing rotation of said locking rod.

3,881,335
ROLL ECCENTRICITY CORRECTION SYSTEM AND METHOD

John W. Cook, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,868
Int. Cl. B21b *37/00*
U.S. Cl. 72—11 **9 Claims**



1. A method of controlling the delivery gauge of a workpiece operative with a rolling mill stand having a pair of work rolls between which said workpiece is passed, and a pair of back-up rolls, with each said work roll being operative with a different back-up roll having eccentricity, said method including the steps of:

establishing the maximum value of said eccentricity of at least one of said back-up rolls in relation to a plurality of angular positions of that said back-up roll before said workpiece is passed between said work rolls,

sensing the angular position of said one back-up roll with said workpiece passing between said work rolls,

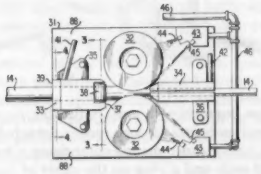
determining a portion of said maximum value of eccentricity of said back-up roll in relation to said sensed angular position, and

controlling the delivery gauge of said workpiece passed between said work rolls in relation to said portion of said eccentricity of said back-up roll.

3,881,336
CONTINUOUS ROLLED ROD DIRECT COOLING METHOD

Daniel B. Cofer; Francis Marion Mitchell; George C. Ward, and Milan Kozak, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Division of Ser. No. 106,149, Jan. 13, 1971, Pat. No. 3,766,763. This application June 6, 1973, Ser. No. 367,593
Int. Cl. B21b *27/06, 45/02*
U.S. Cl. 72—45 **2 Claims**



1. A method of producing aluminum rod while employing rod oxidation control techniques which rod, when drawn into wire using prior art drawing techniques, will possess higher tensile strength and higher electrical conductivity than aluminum rod not produced in accordance with the method, said method comprising the steps of:

passing aluminum rod through a continuous rolling mill having a plurality of roll stands each of which includes an entrance guide means and an exit guide means,

sealingly enclosing said aluminum rod in said entrance guide means and

sealingly engaging said aluminum rod therein to form said sealing enclosure and to support said rod as it enters a roll stand,

flooding said sealingly enclosed entrance guide means with a cooling and lubricating liquid,

rolling said rod down into smaller rod while simultaneously providing a cooling and lubricating liquid to the area in which rolling is occurring, wherein at least a portion of the liquid provided to the area in which rolling is occurring is obtained by overflowing the liquid from the entrance guide means while supplying the liquid to the entrance guide means at a rate greater than the rate of overflowing,

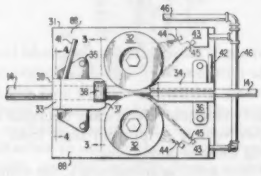
spraying a high pressure stream of cooling and lubricating liquid directly onto said rod immediately after rolling,

enclosing said aluminum rod in said exit guide means, and flooding said exit guide means with cooling and lubricating liquid.

3,881,337
APPARATUS FOR DIRECT COOLING OF CONTINUOUS ROLLED ROD

Daniel B. Cofer; Francis Marion Mitchell; George C. Ward, and Milan Kozak, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Division of Ser. No. 106,149, Jan. 13, 1971, Pat. No. 3,766,763. This application June 6, 1973, Ser. No. 367,594
Int. Cl. B21b *27/06*
U.S. Cl. 72—45 **7 Claims**

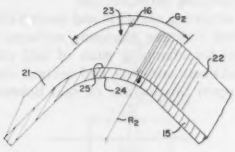


1. In a rolling mill for rolling cast metal bar into an elongate metal rod, said rolling mill possessing individual roll stands, the improvement comprising: rod guiding means at the entrance and at the exit to a roll stand for guiding the rod through a set of rolls mounted in said roll stand, said rod guiding means comprising enclosed guide housing means having sealing means positioned at at least one end thereof, each of said guide housing means having openings at opposite ends thereof to permit passage of the rod therethrough, one of said openings being disposed adjacent said rolls and the other of said openings being disposed outwardly of said rolls, said sealing means being arranged to establish a lesser restriction to liquid flow through said one opening than through said other opening, said sealing means adapted to rollingly contact the surface of the rod for substantially frictionlessly supporting the rod in said housing means, said rod guiding means being affixed to said roll stand, and means for flooding the enclosed interior of said guiding means with liquid whereby said guiding means and rod are cooled and lubricated and the liquid will flow out of said housing through said lesser-restricted one opening onto the respective roll stand for at least partially cooling and lubricating the rolls mounted therein.

3,881,338
METHOD OF BENDING A METAL SHEET AND A CORNER PRODUCED THEREBY

Walter Tischuk, Richmond, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Division of Ser. No. 149,245, June 2, 1971, abandoned. This application Aug. 16, 1973, Ser. No. 388,955
Int. Cl. B21d *5/00, 11/20, 21/00*
U.S. Cl. 72—46 8 Claims



1. A method of bending a building panel along a selected line, comprising

providing a metal facing sheet having an exposed face and a hidden face;

indenting said facing sheet along said selected line to produce a groove in said exposed face and a complementing bead in said hidden face;

applying a backing to substantially the entire area of said hidden face;

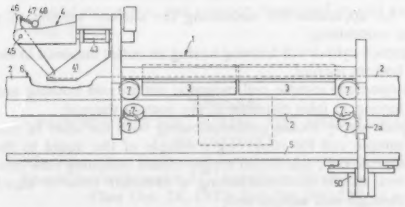
notching said backing to provide a V-groove having an apex proximate to and parallel with said complementing bead; and

bending said building panel about said selected line to provide angularly presented panel segments having a common bending edge and such that the inside of said common bending edge is formed from said complementing bead and the outside of said common bending edge is formed from said groove.

3,881,339
EXTRUSION PULLERS

Keith Edward Mannell, Chestnut, England, assignor to Edwards & Company, Chestnut, Hertfordshire, England

Filed May 23, 1973, Ser. No. 363,148
Claims priority, application United Kingdom, May 25, 1972, 24700/72
Int. Cl. B21c *35/00, 1/14*
U.S. Cl. 72—257 15 Claims

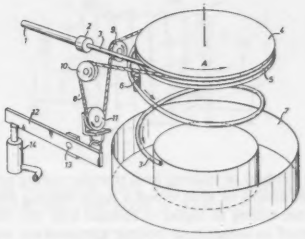


1. An extrusion puller comprising an elongated rail, a carriage and at least one on-board linear motor, means connected between said carriage and said linear motor for driving said carriage along said rail, said carriage carrying a gripper head for grasping the end of the extrusion to be pulled, and said carriage being powered by said on-board linear motor, said linear motor and said means cooperating with said carriage and rail not only for driving the carriage along the rail but also for providing by slippage a clutch effect for pulling control.

3,881,340
DRAWING MACHINE

Robert Thomas Vernon Hay, Southampton, England, assignor to Marshall Richards Barcro Limited, Hampshire, England

Filed Nov. 22, 1972, Ser. No. 308,748
Claims priority, application United Kingdom, Nov. 26, 1971, 54923/71
Int. Cl. B21c *1/14*
U.S. Cl. 72—289 11 Claims

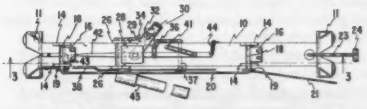


1. A method of reducing the diameter and/or the wall thickness of metal tubing by generating sufficient tension in a length of tubing downstream of a reducing die to draw the tubing through the die, characterized in that the tension is created by urging the tubing into a convex groove section of an endless groove defined by two converging relatively acutely inclined wedging surfaces to releasably wedge the metal tubing therebetween with a sufficient radial force substantially less than and established independently of the drawing tension to prevent relative slip between the tubing and the wedging surfaces when the endless groove and the die are relatively moved at the desired drawing speed and relatively moving the die and endless groove to draw the metal tubing through the die.

3,881,341
BAR STRAIGHTENER

Maurice L. Evans, 1401 Peninah, Yankton, S. Dak. 57078

Filed Feb. 7, 1973, Ser. No. 330,267
Int. Cl. B21d *3/00*
U.S. Cl. 72—297 9 Claims



1. A bar straightening device comprising a longitudinal extending base, support means mounted on said base near end thereof, clamping members pivotally mounted on each of said support means, said clamping member being spaced from said support means whereby a bar can be clamped therebetween, operating means movably mounted on said base between said clamping members, and adapted to engage said bar, said movable mounting being such as to allow movement of at least part of said operating means in two directions perpendicular to each other and transversely of said bar, means on said operating means adapted to engage at least three sides of said bar whereby the operating means is adapted to apply force against said bar in two directions to apply straightening force is those two directions.

3,881,342

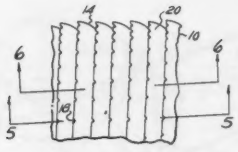
METHOD OF MAKING INTEGRAL FINNED TUBE FOR SUBMERGED BOILING APPLICATIONS HAVING SPECIAL O.D. AND/OR I.D. ENHANCEMENT

John K. Thorne, Decatur, Ala., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 271,835, July 14, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,611

Int. Cl. B21d *53/06*

U.S. Cl. 72—68 **6 Claims**



1. The method of making heat transfer tubing modified for the enhancement of heat transfer from heating fluid flowing through the tubing to liquid in contact with the exterior surface thereof in submerged boiling applications, which comprises providing a multiplicity of axially spaced fin convolutions extending radially outwardly from and around the tubing so as to provide fin convolutions having inner base portions extending generally radially outwardly from said wall and having outer portions terminating in an outer edge, providing a plurality of circumferentially spaced recesses extending inwardly from the outer edges of said convolutions, thereafter bending the fin convolutions laterally uniformly to bring the outer edge of each fin convolution into proximity to the side of the adjacent convolution to form partially enclosed spaces between each pair of adjacent convolutions having continuous circumferentially extending elongated restricted openings communicating with the interior of said spaces, the recesses in the edges of said fin convolutions forming substantial enlargements in said openings, said openings having an average substantially uniform width intermediate said enlargements of not more than 0.007 inch.

3,881,343

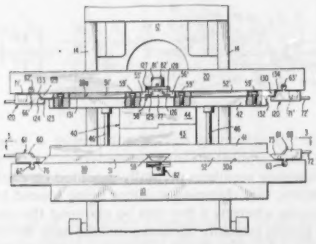
DIE SET CLAMPING MECHANISM

John S. Ducate, Suite 100, 800 Dutch Square Blvd., Columbia, S.C. 29210

Filed July 22, 1974, Ser. No. 490,338

Int. Cl. B21d *37/12*

U.S. Cl. 72—455 **14 Claims**



1. In a metal working apparatus having one or more bolsters for supporting metal shaping die components, a clamping mechanism for securing die components in operative position upon a bolster, comprising:

a. a pair of clamping plates disposed in planar relationship on the bolster with inboard side edges is adjacent, spaced-apart relationship to define a central gap therebetween and outboard side edges directed toward opposite sides of the bolster;

b. means for rigidly securing die components to said pair of clamping plates;

c. first clamping means movable mounted on said bolster adjacent to each of the outboard side edges of said clamping plates, said first clamping means and said outboard side edges having coacting clamping surfaces;

d. second clamping means movably mounted on said bolster and disposed within said central gap adjacent to each of the inboard side edges of said clamping plates, said second clamping means and said inboard side edges having coacting clamping surfaces; and

e. means for actuating said first and second clamping means to move said coacting clamping surfaces into frictional engagement for clamping each of said clamping plates securely between said first and second clamping means and flush upon the surface of said bolster in operative position.

3,881,344

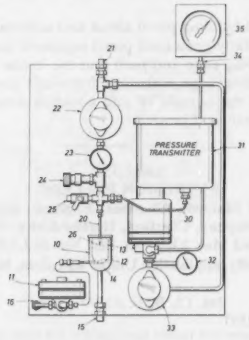
MONITOR FOR CONTINUOUSLY MEASURING SURFACE TENSION OF LIQUIDS

John D. Jobe, Deer Park, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 16, 1973, Ser. No. 351,737

Int. Cl. G01n *13/02*

U.S. Cl. 73—64.4 **5 Claims**



1. An apparatus for measuring the surface tension of a liquid comprising:

a closed cylindrical housing having an outlet disposed in the bottom thereof;

an open top sample cell mounted within said housing and having an inlet disposed in the bottom thereof;

liquid supply means communicating with the inlet of said sample cell for supplying a sample of the liquid to the sample cell, said liquid supply means including flow control means for establishing a constant flow of liquid through said sample cell;

an elongated tubular probe member mounted in said housing and having a first open end extending below the top of said sample cell;

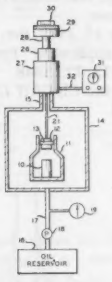
supply means communicating with the other end of said probe for supplying a compressed gas to the probe to form a bubble of said gas on said first end of said probe; and

measuring means disposed to measure the pressure of said gas required to form a bubble in said liquid.

3,881,345
POSITION MEASURING APPARATUS

Wallace W. Souder, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 22, 1974, Ser. No. 444,868
Int. Cl. G01n 3/10
U.S. Cl. 73—94 7 Claims



1. Apparatus adapted to be used to measure movement of an element comprising:

a differential transformer having a primary coil, which is adapted to have a source of alternating current connected thereto, and two secondary coils spaced from one another;

a slug of a magentic material which is adapted to be connected to the element to be measured and to be moved relative to and adjacent said secondary coils;

means connecting said secondary coils in electrical opposition to one another; and

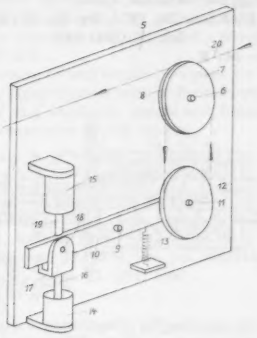
a measuring circuit connected to said secondary coils, said measuring circuit including rectifying means to establish a DC output signal representative of an AC signal established across said secondary coils, amplifying means connected to said rectifying means, said amplifying means having a nonlinear response to a DC input signal such that the gain of the amplifying means increases when the input signal decreases, and a meter connected to said amplifying means.

3,881,346
PROCESS FOR MEASURING THE MODULUS OF ELASTICITY

Erwin Scheucher, Roth near Nurnberg, Germany, assignor to Leonische Drahtwerke AG, Nurnberg, Germany

Filed Oct. 24, 1972, Ser. No. 300,229
Int. Cl. G01n 3/08
U.S. Cl. 73—95.5 6 Claims

1. In a process for the continuous measurement of the modulus of elasticity of an elongated body of metallic or non-metallic material whose yield point corresponds approximately to a predetermined percentage elongation, comprising the steps of: advancing the body along a feed path; stretching the body for attaining a constant percentage elongation while it is being advanced; and continuously measuring the tensile force to attain this elongation, the improvement wherein said step of stretching is carried out to effect such predetermined

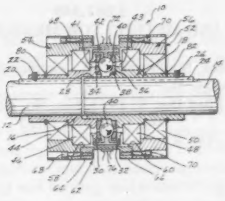


percentage elongation such that the corresponding tensile force is nearly the yield point of the material.

3,881,347
STRAIN-GAUGE, BRUSHLESS TORQUE METER

Wesley F. Buchele, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 22, 1973, Ser. No. 390,602
Int. Cl. G01l 3/14
U.S. Cl. 73—136 R 9 Claims



1. A strain-gauge torque meter comprising, a female input shaft means, means therewith, connecting said input shaft means to

a power source shaft for rotation threwith,

a female output shaft means, means for connecting said output shaft means to a machine shaft for rotation therewith, said means for connecting enabling relative axial displacement of said input and output shaft means,

said power source shaft and machine shaft being in-line and spaced apart, said input and output shaft means having first and second spaced apart flanges thereon respectively having a face substantially perpendicular to the center line of said power source shaft and said machine shaft,

said flanges having a plurality of spaced apart conical seats provided in the faces thereof arranged in an opposing manner,

a ball in each of said opposing conical seats,

said balls transmitting rotational movement from said input shaft means to said output shaft means,

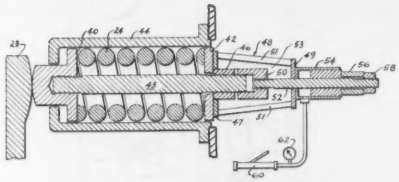
a stationary transducer shell means extending around said input and output shaft means,

said balls tending to roll up the conical seats to separate said first and second flanges to create tension in said shell when rotational force is applied to said input shaft means, said transducer shell means being instrumented with strain gauges which sense tension proportional to torque imposed in said transducer shell when said rotational force is applied to said input shaft means.

3,881,348
HYDRAULIC SPRING ADJUSTING DEVICE FOR BOWL MILLS

John Allison Morton, Helena, Ala., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 20, 1973, Ser. No. 371,638
Int. Cl. G01l *1/02*
U.S. Cl. 73—141 R 3 Claims

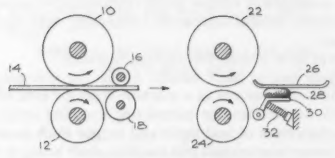


1. Means for adjusting the compression of a spring including a rod, coupling means at a first end of the rod adapted to be connected to a center stud of a spring, jig means surrounding the rod, said jig means having a first base at one end adapted to come in contact with a spring seat, said jig means having a second base at its other end, an annular fluid jack surrounding the rod and being in contact at one end with the second base, means for causing opening of the jack, retaining means secured to a second end of the rod for maintaining the jack in contact with the jig, means for determining the force exerted by the jack, the jig means having an opening in the side wall thereof to permit accessibility to the space inside thereof.

3,881,349
SYSTEM AND METHOD FOR MEASURING DRYING TIME

Joseph J. Stone, Northbrook, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Dec. 5, 1973, Ser. No. 421,849
Int. Cl. G01n *33/32*
U.S. Cl. 73—150 R 2 Claims



1. A system for determining the drying time of a marking fluid deposited on a recording medium comprising

marking fluid deposition means for applying marking fluid timing marks at known intervals therebetween to the recording medium which is advanced therethrough,

first means for advancing the recording medium through said marking fluid deposition means at a regular known rate,

an abrading station for smearing deposited marking fluid prior to its drying on the recording medium,

second means for advancing said recording medium through said abrading station, after the application of a predetermined number of timing marks to said recording medium, at a rate which is very much higher than the rate at which that recording medium was advanced for marking fluid deposition, whereby the drying time of the marking fluid equals

$$T_1 + (T_2 - T_1)\ ((n-1)/(N-1))$$

where T_1 is the time required for the first timing mark to reach the abrader,

T_2 is the time required for the last timing mark to reach the abrader,

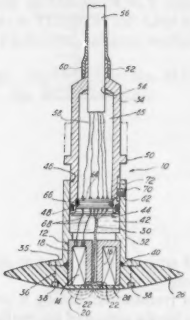
n is the number of the first timing mark to be smeared counted in the sequence of timing marks commencing with the first mark to be deposited, and

N is the number of the last timing mark to be deposited.

3,881,350
ELECTROMAGNETIC SENSOR FOR MEASURING VELOCITY OF FLUIDS UNDER HIGH PRESSURE

Jacques Andre Nosley, Marseille, France, assignor to Societe Ben, Marseille, France

Filed June 15, 1972, Ser. No. 263,255
Claims priority, application France, June 17, 1971, 71.23145; May 4, 1972, 72.15848
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 EM 8 Claims



1. An electromagnetic sensor for measuring velocity of fluids under high pressure comprising first hollow means having a closed end and an open end; electromagnetic means disposed in said first hollow means adjacent said closed end and adapted to establish a magnetic field through a portion of a fluid to be measured; electrode means disposed in said closed end of said first hollow means to serve variations in the magnetic field; electrical conductor means connected with said electromagnetic means and said electrode means; and second hollow means having a first end slidably engaging said open end of said first hollow means with a fluid-tight seal and a second end, said electrical conductor means extending through said first and second hollow means and exiting said electromagnetic sensor through said second end of said second hollow means, said first and second hollow means sliding relative to each other with a piston effect to balance the internal pressure within said first and second hollow means with the pressure of the fluid external of said first and second hollow means.

3,881,351
METHOD OF MEASURING THE MASS FLOW RATE OF A CONSTITUENT OF A GASEOUS STREAM

Otakar P. Prachar, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 29, 1972, Ser. No. 267,589
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 M 1 Claim

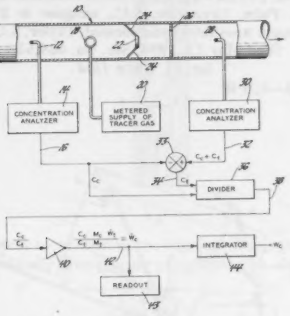
1. A method of measuring the mass flow rate of a constituent of a gaseous flow, the constituent having a known molecular weight, comprising the steps of:

injecting into the gaseous flow a tracer gas at a known mass flow rate and having a known molecular weight,

measuring the combined concentrations of the tracer gas and the constituent in the gaseous flow,

measuring the concentration of the constituent upstream of the tracer gas,

determining the concentration of the tracer gas by subtracting the measured concentration of the constituent from the measured combined concentrations, and

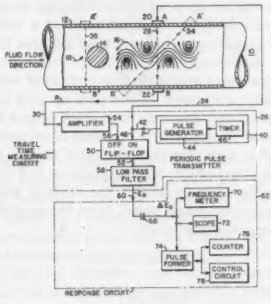


computing by electrical means the mass flow rate of the constituent according to the relationship $W_c = C_c M_c W_t / C_t M_t$ where W_c and W_t are the mass flow rates of the constituent and the tracer gas respectively, C_c and C_t are the concentrations of the constituent and the tracer gas respectively, and M_c and M_t are the molecular weights of the constituent and the tracer gas respectively.

3,881,352
FLOWMETER APPARATUS AND METHOD

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1972, Ser. No. 276,479
Int. Cl. G01f *1/00;* **G01p** *5/18*
U.S. Cl. 73—194 B **3 Claims**



1. An apparatus for measuring the velocity of relative movement in a direction of displacement between a fluid and a body immersed therein, the cross-section of said body being such that fluid disturbances varying at a frequency characteristic of said velocity are created in a zone extending in front and in the wake of said body, said apparatus comprising:

a pulse generator having a constant repetition rate;

transmitting transducer means energized by said pulse generator for directing acoustic signals at said constant repetition rate across said zone at an angle to said direction of displacement;

receiving transducer means responsive to said transmitted acoustic signals after modulation by said disturbances in said zone;

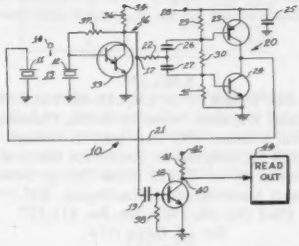
means responsive to said transmitting transducer means and to said receiving transducer means for deriving amplitude signals representing respective time intervals, each time interval being defined between the transmision of one of said acoustic signals by said transmitting transducer means and the reception by said receiving transducer means of a corresponding one of said transmitted acoustic signals; and

means responsive to said amplitude signals for detecting a frequency signal characteristic of fluctuations in the amplitude of said amplitude signals said frequency signal being representative of said velocity.

3,881,353
ULTRASONIC SENSOR

George H. Fathauer, Mesa, Ariz., assignor to Dickey-John Corporation, Auburn, Ill.

Filed Apr. 29, 1974, Ser. No. 465,314
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 A **14 Claims**



1. In a sensing device for determining the passage of high velocity, relatively small articles, the combination comprising: ultrasonic transducer means having an ultrasonic transmitting portion and an ultrasonic receiving portion, said transmitting portion radiating ultrasonic energy having a predetermined wavelength which is determined by the velocity of propagation of the ultrasonic signal divided by the frequency between said transmitting portion and said receiving portion, support means for receiving and holding said transmitting portion and said receiving portion and maintaining a spacing therebetween, said spacing being an integral number of half wavelengths of said predetermined wavelength, amplifier means coupled to said receiving portion of said ultrasonic means to produce an output signal corresponding to the signal received from said transmitting portion and output means coupled to said amplifier means to produce a count signal in response to a change in amplitude of said output signal, whereby high velocity, relatively small articles passing between said transmitting and receiving portions will produce a change in amplitude of said output signal to correspond to said count signal.

3,881,354
FLUID VELOCITY RESPONSIVE INSTRUMENT

Sheldon L. Block, 9517 Woodley Ave., Sepulveda, Calif. 91314

Filed Apr. 17, 1973, Ser. No. 352,012
Int. Cl. G01f *1/00*
U.S. Cl. 73—228 **2 Claims**

1. A fluid flow responsive device comprising:

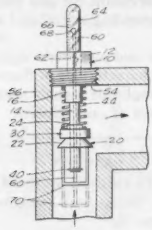
a fluid flow conduit;

an elongated fixed guide extending substantially coaxially of said conduit;

a flow responsive element slidable along said guide and being spaced inwardly from the sides of said conduit sufficiently to substantially eliminate any pressure drop in fluid flowing in said conduit past said element whereby said element moves along said guide only in response to fluid flow in said conduit;

a permanent magnet carried by said element for movement therewith;

means yieldably urging said element and magnet to slide along said guide to an upstream position; and



a magnetically operable reed switch within said guide and responsive to said magnet when proximate thereto to actuate said switch to one of an open and closed condition.

3,881,355

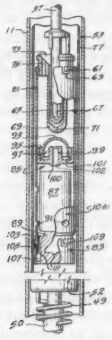
ARCHIVE-CUP INSERT FOR LIQUID-METAL SAMPLING

Paul A. Nelson, Wheaton; Verne M. Kolba, Plainfield; Erwin C. Filewicz, Calumet City, and John T. Holmes, Downers Grove, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 30, 1973, Ser. No. 411,127

Int. Cl. G01n *1/14*

U.S. Cl. 73—422 R **6 Claims**



1. An insert for collecting a sealed sample of liquid metal from within a vertical casing comprising:

a. an elongated tube having detachable support means for retrieving said tube from within said vertical casing;

b. a sample cup for containing sample liquid axially within the lower portion of said tube and spaced from the internal walls thereof to define a passageway for sample liquid overflow;

c. first, overflow seal means for hermetically occluding said tube above said sample cup, said first means having a reservoir for trapping solidifiable sample liquid and an overflow discharge directed into said sample cup; and

d. second, overflow seal means for hermetically occluding said tube below said sample cup, said second means having a reservoir for trapping solidifiable sample liquid received from said sample cup and having an overflow for discharging said sample liquid.

3,881,356

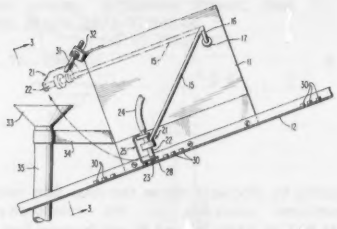
TIME INTERVAL SAMPLING MECHANISM

Ronald K. Palm, Greenville, S.C., assignor to Engineering Development Associates Incorporated, Taylor, S.C.

Filed May 13, 1974, Ser. No. 469,626

Int. Cl. G01n *1/04*

U.S. Cl. 73—423 R **12 Claims**



1. A sampling mechanism for small objects moving in a production stream comprising a body portion adapted for attachment to a discharge tray on which said production stream of small objects are moving, a transport arm for individual samples of small objects taken from said production stream mounted for oscillatory movement on said body portion and adapted to move between a down position close to and above said stream to an elevated sample object release position, power means to produce continuous oscillation of said transport arm between said positions at a substantially constant speed including means to cause the arm to dwell at both the down and elevated positions, a suction pickup unit carried by the transport arm including a resilient valve means which is normally positioned on the pick-up unit to activate suction for seizing one and only one small object from said production stream when said arm is in said down position, and means engageable with said resilient valve means when said arm is in the elevated object release position and moving the valve means sufficiently to disable the suction and thereby release the transported small object from the suction pick-up unit at a sample collection point.

3,881,357

DEVICE FOR INDICATING THE PRESENCE OF A SOLID OBJECT

Sven Lennart Sahlin, Vasterhaninge, Sweden, assignor to AB Mecman, Alvsjo, Sweden

Filed Feb. 8, 1971, Ser. No. 113,439

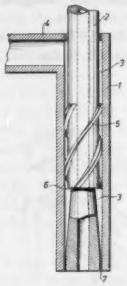
Claims priority, application Sweden, Mar. 11, 1970, 3247/70

Int. Cl. G01b *13/12*

U.S. Cl. 73—37.5 **6 Claims**

1. A device for indicating the presence of a solid object or a liquid surface, comprising a nozzle adapted to be connected to a source of pressurized gas and having an outlet passage formed as a tubular space between two coaxial tubes, pressure sensitive means being connected to the rear end of the inner tube to indicate the changed pressure, when the tubular air curtain ejected from the nozzle hits an object, characterized

in that the outlet passage of the nozzle contains one or several guide ribs extending helically around the axis of the nozzle to



impart a rotary movement to the expelled air, so that a cylindrical or conically diverging air curtain may be obtained.

3,881,358

APPARATUS FOR MEASURING FLUID PRESSURE AT A PLURALITY OF MEASURING POINTS

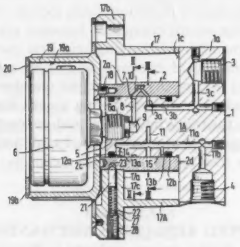
Hans Wölfges, Lohr/Main, Germany, assignor to Gesellschaft fur Hydraulik-Zubehor mbH, Sulzach/Saar, Germany

Filed Aug. 22, 1973, Ser. No. 390,562

Claims priority, application Germany, Aug. 25, 1972, 2241883

Int. Cl. G01l *19/00*

U.S. Cl. 73—420 **11 Claims**



1. Apparatus for measuring fluid pressure at a plurality of measuring points, comprising a selector valve including a stationary member having a cylindrical portion and an end face and including a plurality of inlets each connectable to a different measuring point and an outlet, and a rotary valve member mounted on and surrounding said cylindrical portion of said stationary member and having connecting channel means, said valve member being indexible between a plurality of angular positions in each of which said channel means establishes communication between said outlet and a different inlet of said stationary member; and a pressure gauge connected with said outlet and located adjacent to said end face of said cylindrical portion.

3,881,359

HOT ATMOSPHERE PARTICULATE SAMPLER

Thomas L. Culbertson, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1974, Ser. No. 464,607

Int. Cl. G01n *1/24*

U.S. Cl. 73—421.5 A **6 Claims**

1. A hot atmosphere particulate sampler comprising:

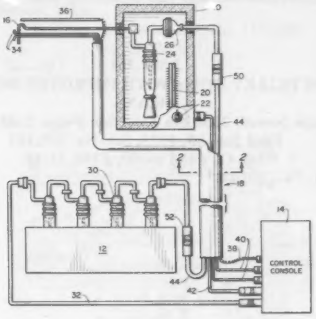
a. an insulated box;

b. means for heating the interior of said insulated box;

c. a separator mounted in said insulated box for receiving the particulate sample;

d. a filter mounted in said insulated box and connected to receive the particulate sample from the separator;

e. a condenser box having impinger bottles in a cooling bath remotely mounted away from said insulated box;



f. means remotely connecting the flow of the particulate sample, from the filter to the condenser box; and

g. means for heating the remotely connecting means to maintain the particulate sample above a predetermined temperature during its flow from the filter to the condenser box.

3,881,360

MEASURING DISPENSING DEVICE

Rodrigo Jurado, 13602 Circle A Trl., Helotes, Tex. 78023

Filed July 9, 1973, Ser. No. 377,773

Int. Cl. B01l *3/02*

U.S. Cl. 73—425.6 **9 Claims**

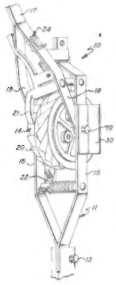
1. A volumetric measuring pump for measuring a predetermined fixed volume of fluid comprising: syringe means including limit means formed thereon, plunger means at least partially disposed within said syringe means for reciprocal movement therein, stop means removably connected to said plunger means so as to move therewith and disposed in engageable relation to said limit means to limit the reciprocal movement of said plunger means, said stop means comprising at least one pin element extending outwardly from the sides of said plunger means and removably mounted thereon, said limit means comprising at least one elongated aperture formed longitudinally in the side wall of said syringe means in substantially surrounding relation to said pin means, said pin means extending through said aperture such that the longitudinal extremes of said aperture engage said pin means, whereby longitudinal movement of said plunger means relative to said syringe means is regulated in opposite directions; a variable volume suction chamber defined by the relative dispositions of the inner portions of said plunger means in the inner end of said syringe means, said syringe means including attachment means formed thereon, a disposable measuring tube mounted on said syringe means by said attachment means, said suction chamber disposed in fluid communication with the interior of said disposable measuring tube, said plunger means being movable from a first to second position within said syringe means to evacuate fluid from at least a portion of said variable volume suction chamber, said plunger means being movable

from said second to said first position to draw fluid into said evacuated portion of said suction chamber, seal means fixedly connected to said plunger and movably disposed on the interior of said syringe and further disposed in fluid sealing relation between said suction chamber and the remainder of said plunger, whereby fluid is drawin into said disposable measuring tube because of the sealed relation of said plunger and said suction chamber and fluid communicating relation between said suction chamber and said measuring tube.

3,881,361
ROPE PULLEY HOIST WITH IMPROVED HOLDING MEANS

E. Strohm Newell, 2350 6th Ave., San Diego, Calif. 92101

Filed July 13, 1973, Ser. No. 379,143
Int. Cl. F16d *69/00*; **F16h** *55/38*
U.S. Cl. 74—230.24 **11 Claims**



1. A power unit useful for pulling a load with a rope line, comprising:

a. a frame for attachment to a fixed object,

b. a pulley member rotatably mounted on said frame and having an annular groove to receive a single strand of rope line,

c. means for pressing said rope line in contact against the pulley member during rotation of the pulley member whereby the rope line is maintained in the annular groove while having a load thereon when the pulley member is rotating in either a clockwise or counter clockwise direction,

d. means for stripping said rope from the pulley member while the power unit is loaded,

e. said rope stripping means being disposed a spaced distance around the periphery of the pulley member from the pressing means so that an unlimited length of rope may be used with said unit,

f. said pressing means and said stripping means being disposed in a fixed relationship with respect to each other and the pulley member,

g. ratchet teeth carried by said pulley member for driving same,

h. a swingable operating lever pivotally mounted on the frame,

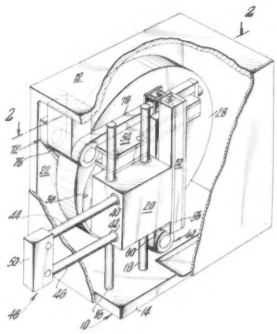
i. a feeding pawl pivoted to the operating lever and engageable with the ratchet teeth to rotate the pulley member when the operating lever is swung in one direction, and

j. a holding pawl pivotally mounted and resiliently biased toward active engagement with the ratchet teeth.

3,881,362
ADJUSTABLE X AND Y AXIS CONTROLLED MOVEMENT MECHANISM

Earl F. Beezer, Hillsdale, N.J., assignor to Stelron Cam Co., Saddle Brook, N.J.

Filed Dec. 20, 1973, Ser. No. 426,604
Int. Cl. F16h *25/12*
U.S. Cl. 74—53 **7 Claims**

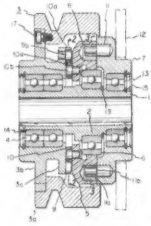


1. A motion transmitting device, particularly for positioning one machine part in relation to another, comprising a first direction guide means, a first member movable to and fro on said first direction guide means, a second direction guide means carried on said first member extending at an angle to said first direction guide means, a second member movable to and fro on said second direction guide means, rotatable shaft means, first drive means connected between said shaft means and said first member for moving said first member, second drive means connected between said shaft means and said second member for moving said second member, each of said first and second drive means having means for adjusting its connection to the associated first and second member for varying the magnitude of movement of said member in accordance with the rotation of said shaft means.

3,881,363
SPEED REDUCTION MECHANISM

Isamu Takasu, Tokyo, Japan, assignor to Toyo Glass Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 416,014, Nov. 15, 1973, abandoned. This application Jan. 30, 1974, Ser. No. 437,785
Claims priority, application Japan, Nov. 18, 1972, 47-115242
Int. Cl. F16h *21/12*
U.S. Cl. 74—63 **10 Claims**



1. A speed changer comprising:

a driving element disposed for rotation at a first speed;

a disc; means for locking the disc against rotation and for mounting it for movement in a closed circular path;

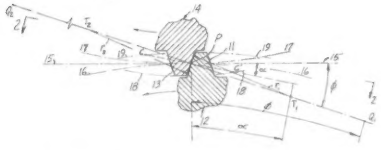
a driven element disposed for rotation;

motion transforming means between one of said elements and said disc, comprising a number of first lugs mounted on one of said elements to define a first circle, the lugs being equally circumferentially spaced apart along said circle, a different number of second lugs mounted on said disc to define a second circle concentric with the first circle, the second lugs being equally circumferentially spaced apart along said second circle, the lugs of one circle being disposed individually — sequentially to bear upon the lugs of the other circle in approximately tangential directions; and

means for drivingly connecting said disc with the element other than said one element;

to effect quiet rotation of the driven element at a speed different from said first speed and defined by the different numbers of lugs in the first and second circles.

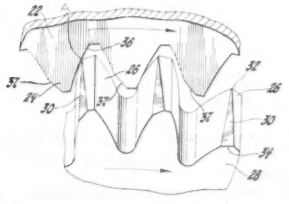
3,881,364
LOW NOISE GEARING
William S. Rouverol, 52 Lovell Ave., Mill Valley, Calif. 94941
Filed Mar. 22, 1974, Ser. No. 453,564
Int. Cl. F16h *55/06*
U.S. Cl. 74—462 **26 Claims**



1. In a pair of mating gears,

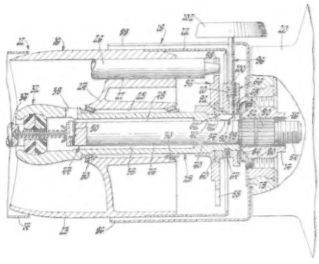
teeth having a profile radius coefficient of less than unity, a pressure angle of less than 40° in planes perpendicular to the pitch line of said pair, an addendum height greater than 0.5 divided by the diametral pitch, and a tooth utilization ratio of substantially unity.

3,881,365
GEARING
Alexander Hardy, 13565 Marion St., Detroit, Mich. 48239, assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 1, 1974, Ser. No. 456,844
Int. Cl. F16h *55/06*
U.S. Cl. 74—462 **6 Claims**



1. A pair of meshing spur gears comprising a first conventionally formed spur gear and a second spur gear having a taper formed along at least one edge of the crown of each tooth thereof, said taper beginning at a tip of said crown at one end of each tooth and extending uniformly along the full length of said tooth to the other end thereof so as to progressively diminish the height of the contacting portion of the wall of said tooth, providing a tapered edge with respect to the axis of said second spur gear for progressively contacting an adjacent wall of a tooth of said first spur gear.

3,881,366
ADJUSTABLE STEERING COLUMN
Arthur W. Bradley, Saginaw, and Robert L. White, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 19, 1973, Ser. No. 416,949
Int. Cl. B62d *1/18*
U.S. Cl. 74—493 **3 Claims**

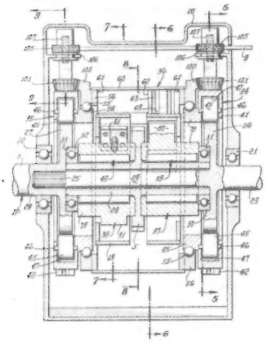


1. In a vehicle steering column including an outer support tube, a main steering shaft means disposed on said support tube for rotation about a first axis of the latter, and an adjustable shaft disposed on said support tube for rotation as a unit with said main shaft means and for axial bodily shiftable movement relative thereto along said first axis between a plurality of positions, the combination comprising, a rod disposed on said main shaft means for rotation as a unit therewith and for bodily shiftable movement relative thereto along a second axis perpendicular to said first axis into and out of a locking position, means disposed between said rod and said main shaft means for maintaining said rod in the locking position, and means on said main shaft means defining a lever including a fulcrum portion engaging said main shaft means and a bearing surface adapted for engagement on said rod and a reaction surface between said fulcrum and said bearing surface engaging said adjustable shaft, said rod in the locking position thereof engaging said bearing surface and generating on said lever a force which is multiplied by a factor corresponding to the lever ratio of said lever and exerted by the latter at said reaction surface on said adjustable shaft thereby to generate a friction force of substantial magnitude between said main shaft means and said adjustable shaft for preventing relative axial bodily shiftable movement therebetween.

3,881,367
INFINITELY VARIABLE RATIO GEAR TRANSMISSION
Bernard J. Call, 2201 Walnut Ave., Manhattan Beach, Calif. 90266
Filed Mar. 18, 1974, Ser. No. 452,208
Int. Cl. F16h *37/06*
U.S. Cl. 74—681 **20 Claims**

1. In an angular motion phase generator for an infinitely variable change speed transmission having two phase generators for driving a summing differential: a frame, a power input shaft journalled in said frame, a power output shaft, first and second cams in phase with one another and rotatable with said input shaft, adjustable ratio control means reciprocable by said cams and including opposed drive members having oppositely facing parallel drive surfaces at opposite sides of said output shaft, first and second driven gear means in out-of-phase relationship, one way clutch means unidirectionally connecting said gear means to said output shaft for driving the same, said gear means being engaged by said drive surfaces,

and said ratio control means including means for angularly adjusting said drive surfaces with respect to said gear means



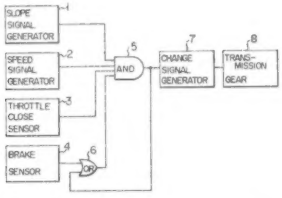
to vary the ratio of input to output motion caused by reciprocation of said ratio control means.

3,881,368

CONTROL DEVICE FOR AUTOMATIC TRANSMISSION IN AUTOMOBILES

Toshio Furuhashi, Katsuta, and Takesi Kinosita, Hitachi, both of Japan, assignors to Hitachi, Ltd.

Filed July 6, 1973, Ser. No. 376,970
Claims priority, application Japan, July 12, 1972, 47-69077
Int. Cl. B60k *21/02*; F16h *3/74*
U.S. Cl. 74—866 **13 Claims**



1. A control device for an automatic transmission in an automotive vehicle of the kind in which the running conditions of the vehicle are detected for controlling the combination of transmission gears, comprising a slope signal generator generating an output signal when the inclination of the vehicle body exceeds a predetermined setting, a vehicle speed signal generator generating an output signal when the running speed of the vehicle exceeds a predetermined setting, a full-closed throttle position sensor generating an output signal when the throttle valve is in the full-closed position, a foot brake actuation sensor generating an output signal in response to the actuation of the foot brake, an OR gate connected to said foot brake actuation sensor to receive a first input therefrom, an AND gate connected to said slope signal generator, said vehicle speed signal generator, said full-closed throttle position sensor and said OR gate to receive a plurality of inputs therefrom, circuit means for applying the output signal of said AND gate to said OR gate as a second input to the latter, and a gear change signal generator connected to said AND gate for controlling the transmission gears so as to establish a gear combination most suitable for braking of the engine depending on the output signal of said AND gate.

4. An electric transmission gear control device for an automatic transmission in an automotive vehicle comprising:

a. a gear change signal generator controlled by combinations of the signals from a throttle valve opening sensor for sensing the opening of a throttle valve and a vehicle speed signal generator for generating an output signal representative of the speed of the vehicle;

b. a downhill sensor generating a first output signal when the inclination of the vehicle body exceeds a predetermined setting;

c. an exceeding speed sensor generating a second output signal when the running speed of the vehicle exceeds a predetermined setting;

d. a full-closed throttle position sensor generating a third output signal when the throttle valve is in the full-closed position;

e. a foot brake actuation sensor generating a fourth output signal in response to the actuation of a foot brake;

f. an OR gate receiving the fourth output signal from said foot brake actuation sensor as its first input signal and generating a fifth output signal; and

g. an AND gate receiving the first, second third and fifth output signals from said downhill sensor, said exceeding speed sensor, said full-closed throttle position, sensor, and said OR gate, respectively and generating a resultant output signal, said resultant output signal being transmitted to said OR gate as its second input signal and to said gear change signal generator, so as to change its output signal to a predetermined lower gear signal irrespective of the combination of the signals from said throttle valve opening sensor and said vehicle speed signal generator.

5. An electric transmission gear control device for an automatic transmission in an automotive vehicle comprising:

a. a gear change signal generator controlled by combinations of signals from a throttle valve opening sensor for sending the opening of a throttle valve and a vehicle speed signal generator having a tacho-generator generating a signal in response to the vehicle speed and rectifier means for rectifying the signal from the tachogenerator;

b. a downhill sensor having

a Colpitts oscillator,

a first coil for receiving an oscillation signal from the Colpitts oscillator,

a second coil magnetically coupled with the first coil,

a shield plate disposed between the first and second coils for varying the oscillation signal to be transmitted therebetween in response to the inclination of the vehicle, and

a first comparator comparing the modified signal from the second coil with a predetermined first reference signal and generating a first output signal when the magnitude of the modified signal exceeds that of the predetermined first reference signal;

c. an exceeding speed sensor having a second comparator comparing the signal from the rectifier means with a predetermined second reference signal and generating a second output signal when the magnitude of the rectified signal exceeds that of the predetermined second reference signal;

d. a full-closed throttle position sensor for generating a third output signal when a throttle valve is in a full-closed position;

e. a foot brake actuation sensor generating a fourth output signal through a NOT gate in response to the actuation of a foot brake;

f. an OR gate receiving the fourth signal from said foot brake actuation sensor as its first input signal and generating a fifth output signal; and

g. an AND gate receiving the first, second third and fifth output signals from said downhill sensor, said exceeding speed sensor, a full-closed throttle position sensor, said OR gate respectively, and generating a resultant output signal, said resultant output signal being transmitted to said OR gate as its second input signal and to said gear

change signal generator to change its output signal to a predetermined lower gear signal irrespective of the combinations of the signals from said throttle valve opening sensor and said vehicle speed signal generator.

6. A control device for an automatic transmission in an automotive vehicle comprising:

first means, responsive to the inclination of the vehicle, for generating a first output signal upon the downhill inclination of the vehicle exceeding a predetermined slope;

second means, responsive to the running speed of the vehicle, for generating a second output signal upon the speed of the vehicle exceeding a predetermined speed;

third means, responsive to the position of throttle valve, for generating a third output signal upon the throttle valve being in its fully-closed position;

fourth means, responsive to the actuation of the foot brake, for generating a fourth output signal upon the actuation of said foot brake;

fifth means, responsive to the position of said throttle valve, for generating a fifth output signal representative of the degree of opening of said throttle valve;

sixth means, responsive to the running speed of the vehicle, for generating a sixth output signal representative of the running speed of the vehicle;

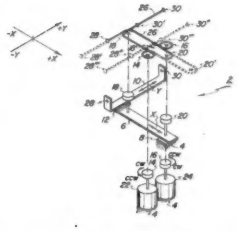
seventh means, coupled to said first, second, third and fourth means, for generating a seventh output signal in response to the simultaneous existence of said first, second, third and fourth output signals; and

eighth means, coupled to said fifth, sixth and seventh means, for normally selecting the gears of said transmission in accordance with said fifth and sixth output signals and for selecting a prescribed gear of said transmission in response to said seventh output signal irrespective of said fifth and sixth output signals.

3,881,369
BI-AXIAL POSITIONER

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,157
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.2 **3 Claims**



1. A drive mechanism for positioning a driven member at any desired coordinate position on an X-Y coordinate plane, including:

a frame,

a first link operatively connected to and reciprocable relative to said frame in an X direction,

a second link operatively connected to and reciprocable relative to said first link in a Y direction, normal to said X direction,

a first and a second pulley rotatably mounted to first and second reversible drive motors respectively, said drive motors being mounted on said frame,

a third and a fourth pulley rotatably mounted on said first link,

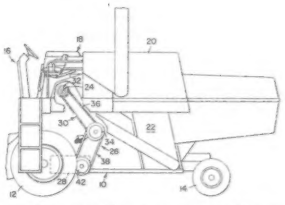
a drive belt connected at each of its ends to said second link and operatively engaging said pulleys,

said drive motors being selectively actuable in either direction of rotation and braked against rotation when not energized for rotation, to effect a desired direction of displacement of the driven member in said X-Y coordinate plane.

3,881,370
VARIABLE SPEED BELT DRIVE FOR AN AGRICULTURAL MACHINE

Bernard Francis Vogelaar, Moline; Mahlon Lloyd Love, Osco, and Charles Edward Cook, Hampton, all of Ill., assignors to Deere & Company, Moline, Ill.

Filed June 29, 1973, Ser. No. 374,901
Int. Cl. F16h *55/56*
U.S. Cl. 74—230.17 F **22 Claims**



1. In a harvesting machine having a mobile main frame mounted on drive wheels, a power source having an output shaft and transmission means drivingly connected to the drive wheels, the combination therewith of improved belt drive means drivingly connecting the output shaft to the transmission and comprising: a shiftable shaft; means mounting the shiftable shaft on the main frame for shifting movement transverse to the shaft axis; a fixed ratio belt drive including a fixed diameter drive sheave operatively connected to and driven by the output shaft, a fixed diameter driven sheave mounted on the shiftable shaft, and a first drive belt drivingly trained around said drive and driven sheaves; and a variable ratio belt drive including a variable diameter drive sheave mounted on the shiftable shaft adjacent the fixed diameter driven sheave and driven thereby, control means operatively associated with said drive sheave for controlling the sheave diameter, a variable diameter torque-sensing driven sheave having a fixed sheave element and shiftable sheave element axially shiftable and rotatable relative to the fixed element, a spring means biasing the shiftable sheave element toward the fixed element and toward a maximum diameter condition, cam means operatively connected to the opposite sheave elements to shift the shiftable sheave element toward the fixed sheave element in response to relative rotation between the sheave elements as a result of torque transmitted therethrough above a predetermined value, and a second drive belt trained around the variable diameter drive and driven sheaves, the spring bias on the torque-sensing driven sheave causing a tension in the second drive belt that is transmitted to the first drive belt through the fixed diameter driven sheave, and the shifting of the sheave elements of the torque-sensing sheave as a result of increasing torque causing increased belt tension in both belts.

14. An improved belt drive comprising: an input shaft; a fixed diameter drive sheave mounted on the input shaft; a shiftable shaft parallel to the input shaft and shiftable toward and away from the input shaft; a fixed diameter driven sheave mounted on the shiftable shaft; a first drive belt means drivingly trained around the fixed diameter drive and driven sheaves; an output shaft parallel to the input shaft and the shiftable shaft; a variable diameter drive sheave coaxially mounted on the shiftable shaft with the fixed diameter driven sheave and operatively connected to and driven thereby, and including control means operatively associated therewith for controlling the sheave diameter; a variable diameter torque-sensing driven sheave mounted on the output shaft and having a fixed sheave element connected to said shaft and a shiftable

sheave element axially shiftable and rotatable relative to the fixed element, a spring means biasing the shiftable sheave element toward the fixed element and toward a maximum diameter condition, cam means operatively connected to the opposite sheave elements to shift the shiftable sheave element toward the fixed sheave element in response to relative rotation between the sheave elements in response to increasing torque transmitted therethrough, and a second drive belt trained around the variable diameter drive and driven sheaves, the spring bias on the torque-sensing driven sheave causing a tension in the second drive belt that is transmitted to the first drive belt through the sheaves mounted on the shiftable shaft.

21. An infinitely variable speed belt drive comprising: a first shaft; a variable diameter drive sheave coaxially mounted on said shaft and including an axially fixed sheave element having an inclined sheave face, an axially shiftable sheave element having an inclined sheave face opposite the fixed element sheave face, spline means coaxially connecting the shiftable sheave element to the fixed sheave element for rotation of the elements in unison while accommodating axial shifting of the shiftable sheave element, and control means operatively associated with the shiftable sheave element for controlling the position of said element; a variable diameter torque-sensing driven sheave including an axially fixed sheave element having an inclined sheave face, an axially shiftable sheave element having an inclined sheave face opposite the fixed sheave element face and mounted for rotation relative to the fixed sheave element, spring means operative between the two sheave elements for biasing the shiftable sheave element toward the fixed sheave element, and cam means operative between the opposite sheave elements for shifting the shiftable sheave element toward and away from the fixed sheave element in response to rotation of the shiftable sheave element in opposite directions relative to the fixed sheave element; and drive belt means trained around the drive and driven sheaves, increasing torque transmitted through the driven sheave element causing the shiftable sheave element to rotate relative to the fixed sheave element so that the cam means causes the shiftable sheave element to move toward the fixed sheave element to increase the driven sheave diameter and increase the tension in said belt.

3,881,371

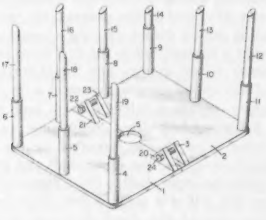
POLISHED ROD GUARDS

James R. Watson, P.O. Box 831, Big Lake, Tex. 76932

Filed July 5, 1973, Ser. No. 376,887

Int. Cl. F16p *1/02*

U.S. Cl. 74—608 **4 Claims**



1. A safety device particularly suited for use as a guard for the the vertical reciprocating motion of the polished rod and rod hanger of a pumping oil well, said guard securely attached in a fixed and stationary position horizontal to the stuffing box of an oil well and including a plurality of upwards standing guard rods.

3,881,372

PRESSURE REDUCING CONTROL DEVICE FOR THE HYDRAULIC CONTROL CIRCUIT OF AN AUTOMATIC TRANSMISSION

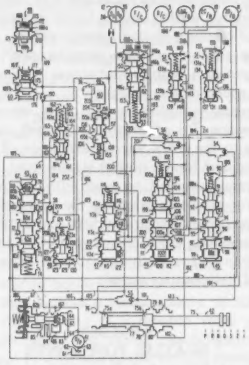
Toshiyuki Miyauchi, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan

Filed Oct. 9, 1973, Ser. No. 404,590

Claims priority, application Japan, Oct. 20, 1972, 47-104953

Int. Cl. B60k *21/00*

U.S. Cl. 74—867 **4 Claims**



1. In a hydraulic control circuit for an automatic transmission of the type wherein a plurality of shift control valves selectively deliver hydraulic fluid to a plurality of frictional elements to cause engagement and disengagement of said frictional elements, having a hydraulic pressure source, a primary pressure regulating valve interposed between said pressure source and said shift control valves to regulate the pressure of the hydraulic fluid supplied to said shift control valves a manually controllable gear selector valve with an inlet connected to said hydraulic pressure source and a plurality of outlets, the improvements comprising:

a. a first speed pressure reducing valve interposed between a first shift control valve and a first frictional element to reduce the pressure of the fluid supplied to the first frictional element when the shift control valve is in a first position and the manually controllable gear selector valve is in a position selecting the lowest forward speed; and

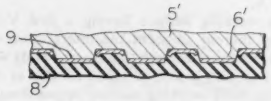
b. a second speed pressure reducing valve interposed between a second shift control valve and a second firctional element to reduce the pressure supplied to said second frictional element when said first shift control valve is in a second position and when said manually controllable gear selector valve is in a position allowing the transmission to shift into its second lowest forward speed but no higher.

4. The improved hydraulic control circuit of claim **1** wherein said first speed pressure reducing valve is also hydraulically connected to said manually controllable gear selector valve so as to transmit hydraulic fluid therethrough when said manually controllable gear selector valve is in a position selecting reverse gear.

3,881,373
METHOD OF MAKING OUTER BLADE FOR ELECTRIC SHAVER

Yoshimitsu Nakamura, Settsu, and Mitsuo Sugioka, Neyagawa, both of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 13, 1974, Ser. No. 450,807
Int. Cl. B21k *11/00*
U.S. Cl. 76—104 R 5 Claims

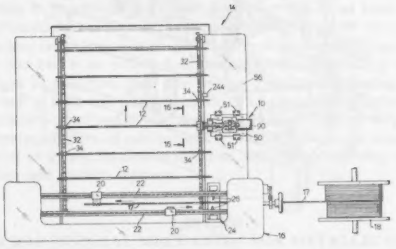


1. A method of making outer blades for electric shavers in which a countersunk part having a smooth hair inlet part is formed on the peripheral edge of each of hair inlet holes, comprising steps of preparing a die in which convex parts and concave parts are alternately and continuously formed and a curved surface having any desired radius of curvature is formed on the shoulder part of each of said convex parts, inserting a metal lamina between said die and a plate-shaped soft material, plastically deforming said metal lamina so as to conform to the surface shape of the die, removing thus deformed metal lamina out of the die, and grinding the deformed metal lamina so as to form therein hair inlet holes.

3,881,374
ROTARY WIRE STRIPPER

Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed May 24, 1974, Ser. No. 473,274
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.51 18 Claims

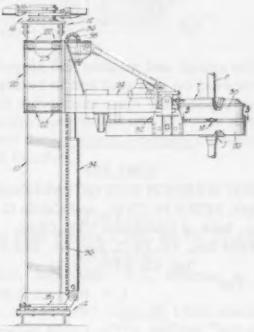


1. A rotary wire stripping machine comprising: a support for releasably positioning an insulated wire member in a stationary position with an end portion projecting from said support, lock means movable from one position to a position in engagement with said support to lock said insulated wire in a stationary position, a table continuously reciprocating between a first position spaced a predetermined distance from the end of said wire to a second position adjacent to the end of said wire, a head member supported on said table for movement with the latter and for rotation about an axis in general alignment with the axis of said wire, said head forming a chamber receiving a predetermined part of the end portion of said wire when said table is in said second position, a pair of opposed blade members supported in said chamber of said head for rotation therewith and being movable from an initial position when said table is in the first position to a cutting position radially inward to engage and sever insulation material at a point spaced from the end of said wire when said table is in a second position, and guide elements movable with each of said blade members to guide the wire member between the end thereof and said blade members, said guide elements and said blade members engaging the severed insulation material as said table is moved from said second to said first position to remove said insulation material from said wire member.

3,881,375
PIPE TONG POSITIONING SYSTEM

Robert R. Kelly, Hoffman Estates, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 12, 1972, Ser. No. 314,285
Int. Cl. B25b *13/50*
U.S. Cl. 81—57.35 13 Claims



1. In combination, pipe tong means engageable with the threadedly engaged joint portions of a tool joint of well pipe extending vertically into a well bore for making up and breaking out said tool joint portions, power actuated hoist means associated with said pipe tong means for vertically moving said pipe tong means along the well pipe between a first inoperative position in which said pipe tong means is below the tool joint and a second inoperative position in which said pipe tong means is above the tool joint, control means associated with said hoist means for controlling the movements of said pipe tong means between said positions, said control means including magnetic eddy current responsive detector means carried by said pipe tong means and sensitive to the tool joint for operating said control means to stop said hoist means when said pipe tong means moves into operative position adjacent to the tool joint in which position said pipe tong means is engageable with the joint portions, and wherein said detector means has a sensing head provided with spacing means for predetermining the space between said sensing head and said joint portions.

3,881,376
SOCKET EJECTING MECHANISM FOR RATCHET WRENCHES

Richard B. Wright, Akron, Ohio, assignor to The Wright Tool & Forge Co., Barberton, Ohio

Filed Mar. 5, 1974, Ser. No. 448,189
Int. Cl. B25b *13/46*
U.S. Cl. 81—63 7 Claims

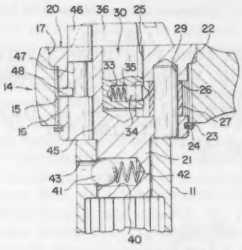
1. A ratchet wrench for driving interchangeable socket heads removably attachable thereto, comprising:

a lever,

a socket carrier mounted in an end of said lever for rotation relative to said lever and including a stud extending downwardly from said lever for receiving and retaining said socket head,

ratchet drive means operatively located between said socket carrier and said lever,

a socket head ejector element extending through said socket carrier for limited endwise sliding movement parallel to the axis of said rotation and adapted to engage a socket received on said stud and to be depressed by the tool user to positively eject said socket head from said stud.



3,881,377

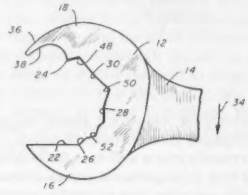
RATCHETING WRENCH FOR OCTAGONAL MEMBERS

James P. Evans, 3233 S.W. 23 St., and Calvin G. Turner, 1037 S.W. 24 St., both of Oklahoma City, Okla.

Filed Dec. 15, 1972, Ser. No. 315,321

Int. Cl. B25b *13/02*

U.S. Cl. 81—186 **1 Claim**



1. A ratcheting wrench for an octagonal and a hexagonal member, the width across opposite corners of the octagonal member being designated by B, the width across opposite sides of the member being designated by A, and the length along a side of the member by D, the wrench comprising: a body;

a handle means attached to the body;

two spaced apart, parallel jaws designated a torquering jaw and a backup jaw, the jaws extending from the wrench body in the direction opposite the handle means, the backup jaw having a planar working surface facing the torqueing jaw, the torqueing jaw having a working surface, facing the backup jaw working surface the torqueing jaw working surface being in the form of a projecting tooth, the distance between said backup and torqueing jaw working surfaces being slightly greater than A, and the body having member engaging working surfaces between the backup jaw and torqueing jaw working surfaces defined by:

a. a first body working surface of length slightly greater than D intersecting said backup jaw working surface at an angle of 45°,

b. a second body working surface of length less than D intersecting said first body working surface at an angle of 45°, the plane of the second body working surface being perpendicular to the plane of said backup jaw working surface, and

c. a third body working surface of length slightly greater than D and at a 45° angle with respect to said second body working surface,

said torqueing jaw terminating at the outer end thereof opposite said handle in an inclined slipping surface adjacent said torqueing jaw working surface, the plane of the inclined slipping surface intersecting the plane of said backup jaw working surface at an acute angle and in the direction of said handle,

said torqueing jaw working surface having a recess therein formed by the intersection of said third body working surface and said projecting tooth, the distance between said backup jaw working surface and said recess being greater than A,

said first body working surface having a first V-shaped notch formed therein adjacent the intersection of said first body working surface with said second body working surface and a second V-shaped notch formed at the end of said second body working surface opposite said first body working surface, said third body working surface forming one side of said second V-shaped notch, said recess in said torqueing jaw working surface, said first and second V-shaped notches, and said backup jaw working surface engaging a hexagonal member.

3,881,378

MACHINE FOR PRODUCING ASPHERICAL SURFACES

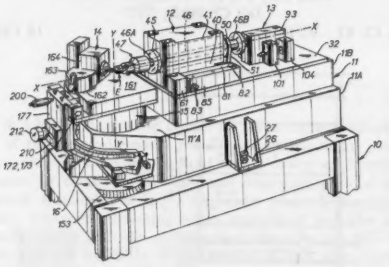
Bruno P. Bettiol, Quincy-Voisins, France, assignor to Essilor International S.A., Joinville-le-Pont, France

Filed Dec. 26, 1973, Ser. No. 427,447

Claims priority, application France, Dec. 29, 1972, 72.46934

Int. Cl. B23b *3/28*

U.S. Cl. 82—19 **21 Claims**

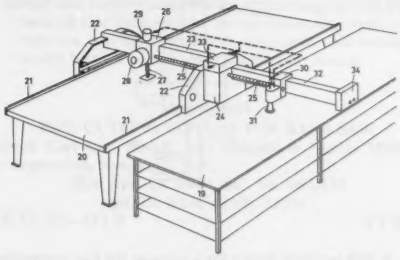


1. A machine for producing concave or convex aspherical surfaces comprising a frame, a spindle, support means carried on the frame for mounting said spindle for rotation about its axis, a blank carrier, means for supporting said blank carrier on said spindle, a cutting tool, first mounting means for mounting the cutting tool for travelling movement along a second axis, second mounting means for mounting the cutting tool for rotation about a third axis substantially perpendicular to said axis of the spindle and said second axis, a fixed control cam fastened to said frame, drive means controlled by said control cam and coacting with said first mounting means to effect the displacement of the cutting tool along a path of movement for cutting the aspherical surface, and first adjustment means for adjusting the orientation of said axis of the spindle in a plane substantially perpendicular to said third axis so that said axis of rotation of the spindle may be brought into precise coincidence with said path of movement of the cutting tool at the center of the aspherical surface to be cut.

3,881,379
METHOD OF AUTOMATICALLY CUTTING OUT MATERIAL PIECES FROM A WEB IN CONFORMANCE WITH A SCANNED CUTTING PATTERN

Günter Otto Stumpf, 7421 Mehrstetten, Kreis Munsingen, Germany

Filed June 13, 1973, Ser. No. 369,760
Claims priority, application Germany, June 14, 1972, 2234674
Int. Cl. D06h 7/00; B26d 1/10
U.S. Cl. 83—49 **2 Claims**



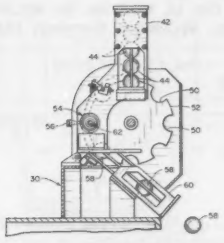
1. A method of automatically cutting out material pieces from a material web in conformance with a cutting pattern of pattern segments, said cutting pattern being formed by a continuous line of predetermined width, comprising; automatically scanning said line with a sensor arrangement sensitive to distinctions between said line and the background of said cutting pattern; transmitting a signal generated in response to sensed distinctions to a control installation; and imparting a cutting movement to a cutting tool for said material in conformance with the signal received by said control installation, said continuous line having portions extending between at least two adjacent pattern segments of said cutting pattern and being in coincident or crossing relationship in at least one location, said sensor arrangement including photo scanning means, conveying said photo scanning means along the center of said line in an oriented relationship with reference to both edges of said line, said line having a portion extending between at least two pattern segments of said cutting pattern in crossover configuration at a crossing angle of about 90°, and forming corners on said pattern segments through the crossing point of a loop formed in said line, said loop extending away from said pattern segment.

3,881,380
SCRAP DISPOSAL MECHANISM FOR METALLIC CAN BODY TRIMMERS

Elpidifor Paramonoff, Los Angeles, Calif., assignor to Standun, Incorporated, Compton, Calif.

Filed Jan. 12, 1973, Ser. No. 323,330
Int. Cl. B23d 21/14
U.S. Cl. 83—150 **22 Claims**

1. In a scrap ring disposal mechanism for metallic can body trimmers and the like of the type wherein a metallic can body is positioned on a mandrel with can body walls at a can body open end being trimmed to sever an annular scrap ring therefrom; the combination of: an annular rotatable frame generally radially outwardly surrounding said can body open end to be trimmed; scrap positioning means on said frame for axially receiving a portion of said can body walls at said body open end of a can body positioned on said mandrel including at least a part of said scrap ring to be severed from said can body during said trimming, said scrap positioning means rotating said scrap ring at least after said scrap ring severing and during rotation of said frame; at least two circumferentially spaced nipper assemblies on said frame each including nipper means actuatable for completely cutting said scrap ring into separated scrap pieces at said nipper assembly; drive means for rotating said frame; nipper actuating means at a circumferential location generally stationary relative to said frame rotation

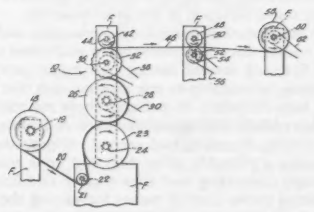


for actuating said nipper means one at a time after said scrap ring severing and during nipper assembly movement past said circumferential location.

3,881,381
APPARATUS FOR PRODUCING RETICULATE SHEET MATERIAL

Frank Kalwaites, Somerville, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 857,989, Sept. 15, 1969, abandoned. This application May 1, 1972, Ser. No. 249,425
Int. Cl. B29c 17/02; B29f 5/00; B32b 3/10
U.S. Cl. 83—170 **42 Claims**

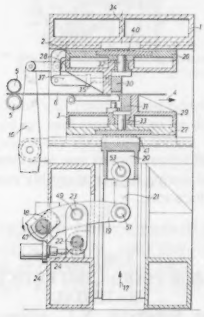


1. Apparatus for forming a reticulate sheet material of a polymer selected from the class consisting of high-density polyethylene and predominantly isotactic polypropylene which comprises; spaced means for supporting and advancing a thin sheet of polymer, said supporting means including means for heating said polymer to a formable state, forming means adjacent said supporting and heating means and in close proximity thereto for removing said polymer while in a formable state from said supporting and heating means while simultaneously applying compressive and shearing forces capable of penetrating through said polymer to form said polymer into a substantially open reticulate structure comprising filaments, said filaments being integral at their intersections and means including said forming means for cooling said substantially open reticulate structure to below the solidification temperature of the polymer and means for removing said reticulate sheet material from said forming means whereby a stretchable reticulate sheet material of said polymer is produced.

3,881,382
FLYING SHEAR FOR CROSS-CUTTING MOVING SHEET-METAL STRIP

Otto Rasenberger, Goeppingen, and Hans Braun, Weilheim, Teck, both of Germany, assignors to L. Schuler GmbH, Goppingen, Germany

Filed Oct. 15, 1973, Ser. No. 406,358
Claims priority, application Germany, Oct. 13, 1972, 2250242
Int. Cl. B23d 25/02
U.S. Cl. 83—305 24 Claims



1. Flying shear apparatus for cross-cutting moving sheet material comprising:

a first cutting bar,

a second cutting bar,

first reciprocating means for reciprocating both of said bars in the travel direction of the sheet material,

second reciprocating means for reciprocating said first bar in a cutting direction transverse to said travel direction, said first and second cutting bars being positioned in opposing relationship to one another such that said cutting bars cooperate to cut said sheet material upon a predetermined relative movement of said cutting bars in the cutting direction, said second reciprocating means including a rotatable drive shaft and drive train means drivingly connecting said drive shaft to said first bar,

and cutting stroke control means for varying the distance said first bar moves in the cutting direction toward said second bar means independently of the rotational speed of the drive shaft, said cutting stroke control means including means engaged with a member of said drive train means,

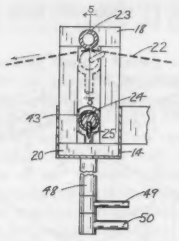
wherein said first reciprocating means includes a movable driving member attached to only one of said cutting bars and linear guide means interconnecting said cutting bars with one another for similar movement in the travel direction, and

wherein said linear guide means includes a coupling member and first and second guide arms, said coupling member being pivotally connected to one of said cutting bars at a position intermediate the ends of said coupling member by a coupling pivot pin, said first guide arm having one end thereof pivotally connected to the other of said cutting bars and the other end thereof pivotally connected to an end of said coupling member, said second guide arm having one end thereof pivotally connected to the other of said cutting bars and the other end thereof pivotally connected to the end of said coupling member which is opposite the end of said coupling member connected to said first guide arm.

3,881,383
WEB SEVERING DEVICE

Ronald W. Alverth, Lombard, and Frank Sander, Chicago, both of Ill., assignors to Uniweb International, Inc., Elmhurst, Ill.

Filed Oct. 23, 1973, Ser. No. 408,642
Int. Cl. B26d 1/36
U.S. Cl. 83—308 10 Claims

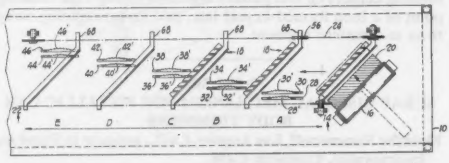


1. A web severing device for a press or the like comprising, in combination, a pair of rotatable rollers freely rotatable in either direction, means for mounting the rollers on the press in generally parallel, spaced apart relationship, said rollers being positioned transverse to the direction of motion of the web and straddling the path of the web so that the web passes between the rollers, means for moving said rollers toward or away from each other to thereby engage or disengage the web between the rollers, and means including a severing blade carried by one of said rollers for severing a moving web, said one of said rollers being operable upon engagement with a moving web to rotate and thereby swing the blade against the web to sever it.

3,881,384
MACHINE FOR CUTTING FROZEN FOODS

Charles J. Frank, Walton Hills, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed July 16, 1973, Ser. No. 379,383
Int. Cl. B26d 7/06, 4/06
U.S. Cl. 83—407 3 Claims



1. A machine for cutting a series of similar frozen food slabs at low temperature, each into a plurality of cut-up pieces which comprises: an essentially planar, elongated support for said slabs, the surface of said support defining along its length a part of travel for said slabs and the resulting cut-up pieces thereof, said support having a plurality of elongated slots along its length, said slots being spaced and arranged in a diagonally staggered array of several locations;

a plurality of toothed saw blades each protruding through said slots in said support there being one or a gang of blades at each of said locations, each of said blades being disposed for intercepting and cutting through said slabs against supporting pressure exerted thereon from said support, all of said blades being substantially parallel to each other and being inclined in a plane oblique to the plane of said support at an angle between about 40° and 60°;

drive means for said blades;

driven conveyor means adapted for propelling said slabs into and through, and the resulting cut-up pieces thereof away from cutting relationship with said blades, said conveyor means being equipped with a plurality of gangs of follower projections, the follower projections of each said gang of follower projections being arrayed for engaging the trailing edge of a slab and the cut-up pieces therefrom and restricting rearward motion thereof in said path of travel;

drive means for said conveyor means: and

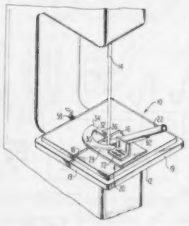
slotted slab holddown means for restraining upward movement of said slabs and the cut-up pieces therefrom while they are moving forwardly in said path; said holddown means being a portion of said conveyor means.

3,881,385

PIPE CUTTING FIXTURE FOR BAND SAW

Vernon Carl Coy, Slidell, La., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Apr. 23, 1974, Ser. No. 463,234
Int. Cl. B23d *53/06, 55/04*
U.S. Cl. 83—411 R **4 Claims**



1. In a fixture for attachment to a band saw for facilitating the cutting of pipe at varying angles and radii to match the curvature of another pipe to which the cut pipe is to be joined, and wherein said band saw comprises a horizontal table including an open center portion with an endless band saw blade projecting therethrough and means for driving said blade to effect cutting of a pipe supported on said table and movable relative to said blade, and wherein said fixture includes a base plate overlying said table, means for pivotably mounting said plate for pivoting about a vertical pivot axis and for moving said plate horizontally along a path including the plate pivot axis and the saw blade, pipe support means carried by said plate for holding said pipe in axial alignment with the plate pivot point and means for pivoting said pipe about a horizontal axis intersecting said vertical pivot axis, the improvement wherein: said means for mounting said plate for pivoting about a vertical axis comprises means for mounting said plate on said table parallel to the saw blade where it projects through said table and to one side and free of said blade, said plate being provided with an arcuate opening through which said blade projects and said blade including a narrow arm which projects within said opening with the vertical pivot axis of said plate extending through said arm.

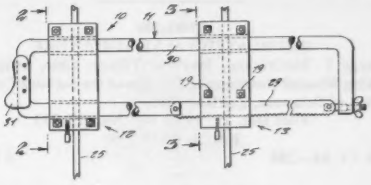
3,881,386

HACK SAW MITER BOX

Joseph E. Zimmerman, 701 S.E. Port, Lincoln City, Oreg. 97367

Filed Feb. 7, 1974, Ser. No. 440,310
Int. Cl. B27g *19/02;* **B27b** *5/02*
U.S. Cl. 83—762 **3 Claims**

1. In a hack saw miter box, the combination of a pair of guide carriers and a tubular hack saw for being slidably supported upon said guide carriers during a sawing operation, each of said guide carriers being comprised of a pair of blocks secured together by means of a bolt and nut means, a pair of tubular guide sleeves being clamped between one of said guide carriers while a singular tubular guide sleeve is clamped between said blocks of the other said guide carrier, each of said guide carriers being supported upon a pair of vertically extending, parallel, spaced apart support rods each one of which extends slidably free through each one of said blocks of each said guide carrier, said rods being longer than said blocks, and said rods at their lower ends being supported upon a rod support.

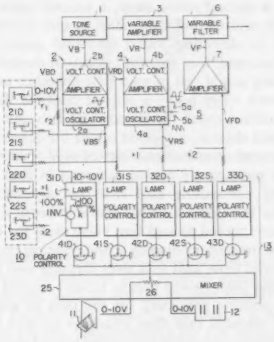


3,881,387

ELECTRONIC MUSICAL INSTRUMENT WITH EFFECT CONTROL DEPENDENT ON EXPRESSION AND KEYBOARD MANIPULATION

Fukushi Kawakami, Hamamatsu-shi, Shizuoka-ken, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha

Filed Feb. 13, 1974, Ser. No. 441,996
Claims priority, application Japan, Feb. 19, 1973, 48-21524
Int. Cl. G10h *1/02, 5/02*
U.S. Cl. 84—1.24 **4 Claims**



1. An electronic musical instrument which comprises:

a controllable tone source section for developing tone signals;

at least one tone modifying circuit cooperative with said controllable tone source and receptive of said tone signals for developing time variations of the frequency and amplitude of said tone signals to modify the tonal effect of said tone signals;

at least one modification signal generator which develops modification signals applied to said tone modifying circuit for determining the frequency and amplitude variations of said tone signals developed by said tone modifying circuit;

a control panel section which produces at least one first control voltage applied to said modification signal generator for controlling said modification signal;

an expression-keyboard controlled section including manually set expression control device and a keyboard for producing at least one second control voltage whose

value is representative of the setting of said expression control device and said keyboard;

and means for selectively applying said second control voltage to said modification signal generator for controlling said modification signal.

3,881,388

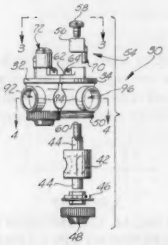
BIFURCATED VALVE STRUCTURE

George T. McCracken, Mayfield Village, Ohio, assignor to King Musical Instruments, Division of the Seeburg Corporation of Delaware, Eastlake, Ohio

Filed Dec. 11, 1973, Ser. No. 423,733

Int. Cl. G10d *9/04*

U.S. Cl. 84—388 **5 Claims**



1. A valve for use in a musical instrument for controlling the flow of sound through the instrument comprising, a unitary block valve body, first and second chambers adjacently located in said unitary block valve body, a first valve stem, a first rotor mounted for rotation on said first valve stem in said first chamber, a second valve stem, a second rotor mounted for rotation on said second valve stem in said second chamber, a first inlet for directing sound into said unitary block valve body and into said first chamber disposed therein, a first outlet for directing sound out of said first chamber and out of said unitary block valve body, a second inlet for directing sound into said unitary block valve body and into said second chamber disposed therein, a second outlet for directing sound out of said second chamber and out of said unitary block valve body, and passageway means disposed in said unitary block valve body connecting said first and second chambers to provide for the flow of sound therebetween, a first actuator assembly connected to said first valve stem for effecting rotation of said first rotor between a first position providing for the flow of sound from said first inlet through said first chamber, through said passageway means to said second chamber and a second position providing for the flow of sound from said first inlet through said first chamber to said first outlet, a second actuator assembly connected to said second valve stem for effecting rotation of said second rotor between a first position providing for the flow of sound from said first chamber through said passageway means and said second chamber to said second outlet and a second position providing for the flow of sound from said inlet through said second chamber to said second outlet, said first inlet, said first outlet and said passageway means are spaced apart approximately 120° about said first chamber, said second inlet, said second outlet, and said passageway means are spaced apart approximately 120° about said second chamber, said first actuator assembly including a first actuator member and a first pair of stop members, said first actuator member effecting rotation of said first valve stem and said first rotor, said first actuator member includes a stop surface thereon which is operable to engage with one of said first pair of stop members when said actuator member is rotated in a first direction to position said first rotor in said first position and is operable to engage with the other of said first pair of stop members when said first actuator member is rotated in a second direction, opposite said first direction, to position said first rotor in said second position, and said second actuator assembly includes a second actuator member and a second pair of stop members, said second actuator member effecting rotation of said second valve stem and said second rotor, said second actuator member includes a stop surface thereon which is operable to engage with one of said second pair of stop members when said second actuator member is rotated in said first direction to position said second rotor in one of said positions and is operable to engage with the other of said second pair of stop members when said second actuator member is rotated in said second direction to position said second rotor in the other of said positions and wherein said first and second actuator assemblies are operable to be simultaneously actuated to effect simultaneous rotation of said first and second rotors.

3,881,389

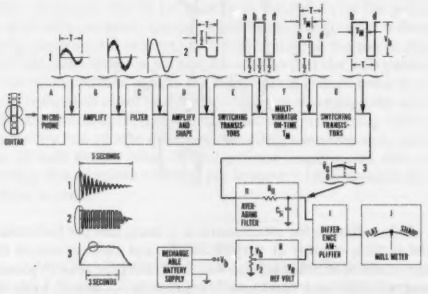
ELECTRONIC GUITAR TUNER

Frederick G. Allen, Los Angeles, Calif., assignor to F. G. Allen Associates, Inc., Los Angeles, Calif.

Filed May 21, 1973, Ser. No. 361,859

Int. Cl. G10g *7/02*

U.S. Cl. 84—454 **4 Claims**

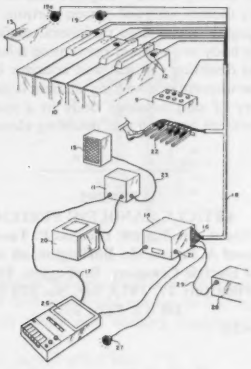


1. An electronic device for tuning a stringed instrument comprising: transducing means for converting into an electrical signal the acoustic vibrations of a struck, plucked or bowed string; filter means for removing unwanted noise and overtones from said signal; amplifier and limiting means for rendering all excursions of said signal of equal amplitude for a sufficient time after the striking of the string to permit frequency measurement thereof; one-shot multivibrator means responsive to said signal for delivering pulses having frequency of said signal and having predetermined width determined by the internal parameters of said multivibrator means, so that the average DC value of said pulses becomes proportional to the frequency of said signal; filter means to extract the average DC value of said pulses; a DC reference voltage; means for comparing said DC reference voltage and said average DC value, thereby to indicate whether the fundamental frequency of the struck string is above or below a predetermined frequency; a single DC supply voltage; transistor switching means following said multivibrator means for making said average DC value of pulses proportional to said DC supply voltage; voltage divider means for making said DC reference voltage also proportional to said DC supply voltage, so that both average DC value of pulses and reference voltage rise and fall together with changes in supply voltage, with the result that when the two voltages are matched by tuning to the correct frequency, their difference continues to be zero over a considerable range of supply voltage, making regulation unnecessary.

3,881,390
SIGHT AND SOUND MUSICAL INSTRUMENT INSTRUCTION WITH EXPANDED CONTROL CAPABILITIES

Cecil F. Gullickson, 2018 Fosgate Dr., Winter Park, Fla. 32789

Continuation-in-part of Ser. No. 182,484, Sept. 21, 1971.
This application Nov. 21, 1973, Ser. No. 418,211
Int. Cl. G09b *15/08*
U.S. Cl. 84—478 34 Claims



1. An instructional device for a musical instrument having a keyboard, comprising a plurality of illumination means disposed within the keys of such instruments, a stereo cassette type tape player arranged for playing a prerecorded tape contained in a cassette, such tape containing aural instructions and coded instructional information, control means operatively connected to said plurality of illumination means, and decoder means responsive to such coded instructional information, said decoder means comprising signal conditioning means for accepting such coded instructional signals from such tape, whereby noise, interference, crosstalk and level variations originating from said tape player are effectively eliminated, and decoder memory means responsive to such conditioned signals whereby said control means are caused to selectively energize said plurality of illumination means singly and in various combinations and sequences, and for selected periods of time as determined by such instructional information.

3,881,391
QUICK-MOUNT CAPS

Timothy B. Dereszynski, 700 W. Layton Ave., Milwaukee, Wis. 53221

Filed July 5, 1973, Ser. No. 376,310
Int. Cl. A47g *3/00*
U.S. Cl. 85—55 9 Claims

1. A bolt cover assembly for covering the exposed end of a hold-down bolt and nut for a toilet fixture, the assembly comprising:

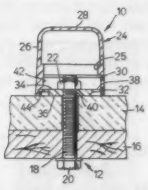
a cap having a hollow cylindrical body member,

a top enclosing one end of said body member,

a first groove in said body member spaced upwardly from the open end a distance greater than the height of the nut,

and a second groove in said body member between said first groove and the open end of said member,

and a resilient disc having a central hub, a flange extending radially outw ard from said hub a distance greater than the inner diameter of said cylindrical body member and a central opening in said disc having a diameter less than said bolt, said second groove being spaced inwardly from the open end of said member a distance substantially

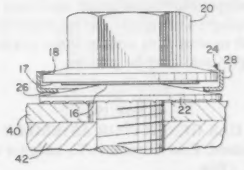


equal to the thickness of the central hub, whereby said disc is adapted to be mounted on said bolt on either side of the nut and said cap can be mounted on said disc with said flange seated in one of said first or second grooves.

3,881,392
TENSION INDICATING FASTENER UNIT

Gary Martin Curtis, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 28, 1974, Ser. No. 437,597
Int. Cl. F16b *31/02*, *39/24*
U.S. Cl. 85—62 11 Claims

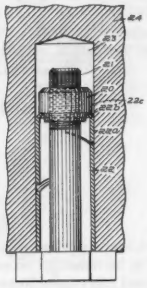


1. A preassembled tension indicating fastener unit comprising a rotary fastener member with rotation inducing surfaces, a generally circular bearing surface located beneath the rotation inducing surfaces and integral therewith, a conical-like spring washer device preassembled to the rotary fastener member, the washer device having an inner periphery spaced upwardly from its outer periphery, a generally circular indicating member preassembled to the unit and including a central aperture concentric with the outer periphery, the indicating member comprising radially inwardly extending flange means positioned between outer peripheral marginal portions of the bearing surface and the upper surface of the spring washer device, the inner periphery of the flange means being substantially equidistant from the axis of the fastener member and the spring washer device, side wall portions integral with the flange means extending upwardly therefrom surrounding the circular periphery of the bearing surface preventing lateral movement of the indicating member relative to the bearing surface and retaining the inner periphery of the flange means equidistant from the fastener and spring washer device axes, wherein the flange means is adapted to be pinched between said outer peripheral marginal portions of the bearing surface and the upper surface of the spring washer device as the spring washer device is compressed to a predetermined height which is directly related to a predetermined tension in the fastener unit.

3,881,393
EXPANSION FASTENER

Maxwell S. Campbell, P.O. Box 134, Elkins, N.H. 03233

Filed Nov. 27, 1972, Ser. No. 309,702
Int. Cl. F16b *13/06*
U.S. Cl. 85—64 6 Claims

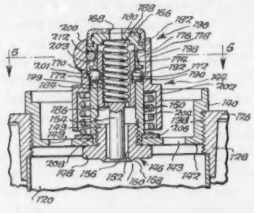


1. An expansion fastener comprising: a bolt; a spring coil surrounding said bolt, said coil being a flat helically wound strip having generally cylindrical inner and outer surfaces, and said coil having axially spaced turns all of substantial width in the axial direction and being adapted to expand radially under axial load; a bearing element connected to said bolt and having a generally annular portion, said coil having a turn nearest said bearing element free to expand radially; and connecting means surrounding said annular portion and fixedly connected to said bearing element and said nearest turn, said connecting means being adapted to flatten under axial load and having an outer portion adapted to expand and maintain bearing engagement with said nearest turn and an inner portion adapted to contract and grip said annular portion.

3,881,394
GAS GENERATOR ASSEMBLY

Loyal G. Netteland, East Aurora, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Division of Ser. No. 180,558, Sept. 15, 1971, Pat. No. 3,756,785. This application Mar. 29, 1973, Ser. No. 345,992
Int. Cl. A62b *7/08*
U.S. Cl. 89—1 B 9 Claims

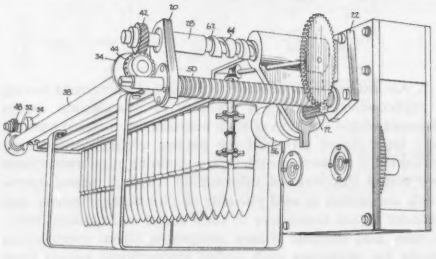


1. In combination with oxygen evolving apparatus adapted to be carried with the user; a manually operable actuating mechanism for igniting an oxygen evolving candle in said apparatus comprising: a casing; a retainer mounted in said casing adapted for connection to a cartridge containing an oxygen evolving candle, an actuator body mounted in said casing, said actuator body having adjacent peripheral surface portions of different dimensions, a firing pin mounted in said actuator body and movable from a cocked position to a firing position, means biasing said firing pin to said firing position, means retaining said firing pin in said cocked position against said biasing means, means for disabling said retaining means enabling said firing pin to move to said firing position, said disabling means comprising an element movably mounted on said actuator body for movement between a first position where said retaining means maintains said firing pin in said cocked position to a second position disabling said retaining means, and means locking said disabling means to prevent actuation of said firing pin into said firing position, said locking means comprising an elongated element having adjacent portions of different cross section and mounted in said disabling element for movement between a locked position wherein said locking element engages said actuator body on the periphery thereof with one of said portions of said locking element engaging one of said peripheral surface portions of said actuator body in a manner preventing relative movement between said disabling element and actuator body and a release position wherein said locking element is disengaged from the periphery of said actuator body in a manner allowing relative movement between said disabling element and actuator body.

3,881,395
ARTICLE HANDLING SYSTEM

Thomas W. Cozzi, Burlington; Douglas P. Tassie, St. George, and Raymond A. Patenaude, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed July 17, 1973, Ser. No. 379,930
Int. Cl. F41d *9/02*
U.S. Cl. 89—34 26 Claims



1. An article storage and feed system, comprising:
an array of laterally spaced apart channels, each channel for storing a respective plurality of articles in a respective column along a longitudinal axis,
first means for concurrently engaging each of the plurality of articles in any one of said plurality of channels and for sequentially extracting such articles as a train of articles of uniform pitch;
second means, coupled to said first means, for translating said first means to each of a plurality of extraction stations in sequence, each of said extractor stations being adjacent a respective one of said plurality of channels; and
control means, coupled to said second means, for automatically actuating said second means.

3,881,396
PORTABLE BORING BAR

Charles E. Case, Virginia Beach, Va., assignor to Ernest E. Grimsley, Portsmouth, Va.

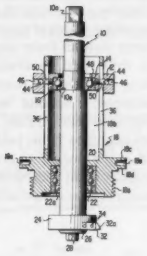
Filed Mar. 1, 1974, Ser. No. 447,261
Int. Cl. B23c *1/20*
U.S. Cl. 90—12.5 10 Claims

1. A tool for machining the seal ring seat in a valve, said tool comprising:
a generally hollow housing having a first cylindrical portion threaded so that it may be screwed onto said valve, and a second cylindrical portion with external threads and

first and second slots extending generally axially along said second portion;

manually operable feed ring means having an interior annular recess and internal threads which match with the threads on the second portion of said housing, said feed ring means being mounted on said second portion of said housing whereby rotation of said feed ring means advances it axially along said housing;

an arbor bar extending through said housing and adapted to be rotationally driven;



cutting tool means mounted on said arbor bar at the end nearest the first cylindrical portion of said housing;

bearing means within said housing supporting said arbor bar;

means acting on said arbor bar,

Means extending through said slots and into said annular recess and acting on the means acting on the arbor bar, for axially moving said arbor bar in response to rotational movement of said feed ring.

3,881,397

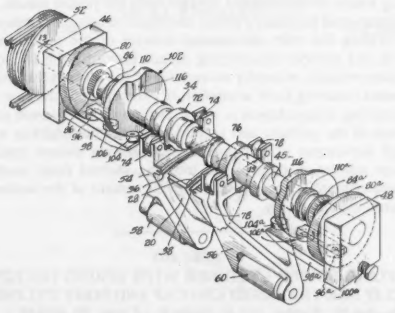
METHOD AND TOOLING FOR CUTTING SIDE SEAL GROOVES

Oliver E. Saari, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 244,030, April 14, 1972, Pat. No. 3,786,702. This application Dec. 17, 1973, Ser. No. 425,482

Int. Cl. B23d *5/02*

U.S. Cl. 90—24.3 **8 Claims**



1. Apparatus for forming an elongate seal accommodating slot in the side surface of a rotor of a rotary type internal combustion engine including a longitudinally reciprocable elongate slotting blade having a series of cutting teeth provided along one marginal edge thereof, means for clampingly holding and retaining said blade so that the teeth are aligned along an arcuate path corresponding to the desired arcuate configuration of the seal accommodating slot, means for providing a limited oscillation of the clamping means and the arcuate aligned teeth about a predetermined center point and providing a cutting stroke and return stroke, cam means for providing an orbital path to the cutting teeth including means for retracting the cutting teeth from engagement with the workpiece after each predetermined limited cutting stroke along the arcuate path, means for advancing the cutting teeth to successively greater depths into the workpiece surface, means for supporting a rotor in a predetermined fixed position with a side surface thereof located in proximity to and in substantial parallelism with the cutting teeth of said blade.

3,881,398

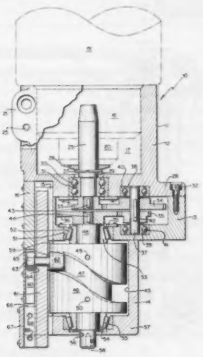
RECIPROCATING TOOL ATTACHMENT FOR MILLING MACHINE

Vincent J. Gravagne, 15 Beverly Way, Wayne, N.J. 07420

Continuation-in-part of Ser. No. 294,562, Oct. 3, 1972, abandoned. This application May 8, 1974, Ser. No. 468,334

Int. Cl. B23d *41/08*

U.S. Cl. 90—96 **2 Claims**



1. A tool attachment for milling machines to permit reciprocating cutting operations on metallic materials comprising:

a housing;

a cylindrical cavity in the upper portion of said housing adapted to receive the spindle column of a milling machine head, providing a rotatable drive shaft received in said spindle column for said tool attachment;

a screw-operated clamp to secure said housing to said milling machine head;

an expansion screw to expand said housing for release of said housing from said milling machine head; said clamp and said expansion screw providing means for connection and release of said tool attachment to the head of a milling machine;

a cam connected to said rotatable drive shaft having a helix curve grooved on said cam;

a reciprocating ram slidably received in said housing;

a cam follower on said reciprocating ram adapted to be slidably received in said cam groove; said cam and cam follower providing means for conversion of the rotary motion of said shaft to the reciprocal motion of said ram; a tool bit having a shaped end for cutting a geometric shape;

a slot in said reciprocating ram adapted to receive said tool bit;

a support plate to cover said slot and hold said tool bit in position;

means for securing said support plate in position;

a shaft extending from said cam and being coaxial with said drive shaft;

a cylindrical cavity in the base of said shaft extending from said cam adapted to receive a dial indicator instrument; a dial indicator instrument having a cylindrical shaft adapted at its upper end to be received into said cylindrical cavity, the measuring element of said indicator extending downward to a horizontal plane in alignment with the lower end of a tool bit in said ram;

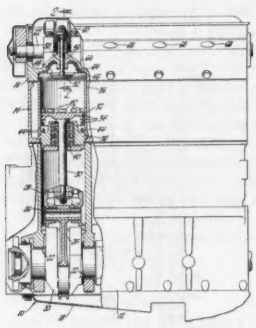
means for securing said indicating instrument in said cavity; said indicator instrument being visible to the operator and capable of indicating the precise center of a work piece.

3,881,399

STEAM ENGINE WITH IMPROVE INLET VALVE ARRANGEMENT

Charles J. Sagi, Rochester, and Charles A. Amann, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1970, Ser. No. 32,815
Int. Cl. F01l *31/08*
U.S. Cl. 91—325 **4 Claims**



1. A steam engine expander of the type having a cylinder, a piston movable in said cylinder and connected with a crank mechanism for the delivery of power, a steam inlet opening in a wall of said cylinder and connecting said cylinder with a throttled supply of steam for operation of said engine over a varied speed range, a poppet inlet valve adapted to close said opening and movable between open and closed positions, and valve actuating mechanism operable to open and close said valve on a predetermined lift curve fixed with respect to the engine piston motion and the respective angular positions of the crank mechanism, said valve mechanism being arranged to require a crank angle change of at least 18% of the total crank angular movement during the valve closing period to move the valve through the final 5% of its closing motion.

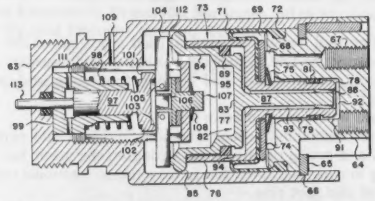
3,881,400

FLUIDIC OPERATED VALVE ACTUATOR

Frank D. Lewis, Sr., Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Division of Ser. No. 6,980, Jan. 28, 1970, abandoned. This application Feb. 27, 1973, Ser. No. 336,255
Int. Cl. F01b *7/20*
U.S. Cl. 92—52 **2 Claims**

1. A low, fluidic pressure operated force amplifying actuator comprising: a hollow housing, the interior of the housing being compartmented into a fluid receiving compartment portion and an operating compartment portion vented to the ambient atmosphere; piston means including an assembly of concentrically mounted primary and secondary piston members each having a sidewall and adapted for reciprocation within the housing during ingress and egress of low, fluidic pressures into and from said fluid receiving compartment portion; an impervious flexible diaphragm positioned between and connected to the sidewall of the housing and the primary piston member forming with the piston means a first fluid receiving compartment and providing a fluid tight seal between the first fluid receiving compartment and the operating compartment; a seal means between the confronting sidewalls of the concentric primary and secondary piston members forming in conjunction with the primary and secondary piston members a second fluid receiving compartment and providing a fluid tight seal between the second fluid receiving compartment and the operating compartment, said second fluid receiving compartment distinct from and without direct communication with the first fluid receiving compartment; a first means for admitting low, fluidic pressure into said first fluid receiving compartment; a second means for admitting low, fluidic pressure into said second fluid receiving compartment, said second means separate from said first means; an operating rod means within the operating compartment and reciprocable along with said piston means during ingress and egress of low, fluidic pressures into either of the first and second fluid



receiving compartments, the operating rod means having a portion thereof extending exteriorly of the housing and includes a spring biasing means so that the operating rod means is normally spring biased toward the piston means; and force amplifying motion transmitting means interposed between the piston means and the operating rod means whereby when low, fluidic pressures are admitted to either of the first and second fluid receiving compartments the piston means moves the motion transmitting means to cause the operating rod to move, the spring biasing means on the operating rod means maintaining the operating rod means in operational contact with the motion transmitting means being by the secondary ting means in operational contact with the piston means, said primary and secondary piston members structural relationship providing the only operational contact of the piston means with the motion transmitting means being by the secondary piston member whereby movement of the motion transmiting means resulting from admission of pressure into the first fluid receiving compartment is accomplished by concurrent movement of the primary and secondary piston members as a unit and movement of the motion transmitting means resulting from admission of pressure into the second fluid receiving compartment is accomplished by movement of the secondary piston member only.

3,881,401

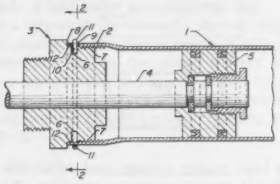
FLUID POWER CYLINDER WITH SPRING LOCKING CLIP FOR THREADED END CAP AND BODY CYLINDER

Charles W. Bimba, 101 E. Main St., Crete, Ill. 60449

Filed Oct. 29, 1973, Ser. No. 410,800
Int. Cl. F16j *11/02*
U.S. Cl. 92—169 **3 Claims**

1. In a fluid power motor unit having a cylindrical body section, a removable end cap for at least one end thereof, a movable piston member in the body section, a piston rod connected to the piston member, and fluid inlet-outlet means to the interior of the body section to receive and discharge a pressurized fluid stream which gives motion to the piston

member and there is a threaded assembly between said removable end cap member and the cylindrical body section which can become loosed from each other by jarring from the motion of the piston member, the improved construction and assembly which comprises, having a continuous peripheral relatively narrow and deep groove that is around the midportion of the end cap member at a position closely adjacent the termination of external threading provided on the interior end portion of such cap member, a raised shoulder around the exterior of said cap member and positioned beyond said groove and toward the outer portion of the cap member with respect to the interior termination of the threading thereon, having internal threading on the end portion of the body section which engages said external threading on said cap

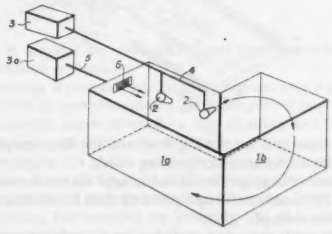


member and encompasses the interior end portion thereof to the point of contact of the end of the body section with said raised shoulder whereby the narrow groove is totally covered by the body section, further having a small hole through the wall of said body section at a location near the end thereof and in alignment with said peripheral groove in said cap member when the body section is tightly engaged over the latter, and a greater than **180°** spring wire clip member sized and shaped to snap-fit around said cylindrical body section and also have a short inwardly bent pin-like portion that is sized to fit through said hole in the wall of the latter and also sized to fit into and be only slightly smaller than said narrow peripheral groove in said cap member, whereby the latter will be held from disengagement with said body section.

3,881,402
DISTRIBUTING VENTILATING MEDIUM WITHIN SPACES

Birger Larkfeldt, Odensjo-Barnarp, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed May 4, 1973, Ser. No. 357,252
Int. Cl. F24f *13/00*
U.S. Cl. 98—40 N **9 Claims**

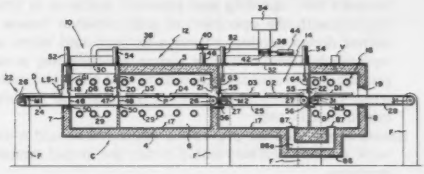


1. A method for ventilating spacious public rooms, workshop spaces, industrial halls, and like spaces, in which the ventilating medium within the space is conveyed and distributed to selected areas within the space; comprising the steps of supplying ventilating medium in the required amount at low velocity, directing the ventilating medium into a controlled circulating path by means of a plurality of ejectors positioned in said path; supplying each ejector with medium to emit a jet of high velocity, the amount of which high velocity medium is small with respect to the ventilating medium; and locating said ejectors within said space in said circulating path in a series so that the second ejector of the series is disposed within the action range of the first ejector in the series.

3,881,403
APPARATUS FOR MAKING BREAD AND LIKE FOOD PRODUCTS

Charles E. Ingram, Freeland; Roy H. Brunk, Saginaw, and Edward Witkoske, Plymouth, all of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Mar. 30, 1973, Ser. No. 346,642
Int. Cl. H05b *9/06*
U.S. Cl. 99—338 **3 Claims**



1. A baking system including:
a proofing chamber for proofing dough product;
a cooking chamber for cooking proofed dough product;
conveyor means for successively receiving and conveying dough product through said proofing chamber and moving proofed dough product from said proofing chamber through said cooking chamber;
means for introducing microwave energy into said proofing chamber and said cooking chamber;
microwave shield means in said proofing chamber and said cooking chamber selectively operable to prevent the escape of microwave energy from said chambers;
means for operating said conveyor means at a predetermined speed to move dough to said proofing chamber, transfer proofed dough product from said proofing chamber to said cooking chamber, and remove cooked product from said cooking chamber;
means for interrupting the operation of said microwave energy introducing means when product is transferred to and from said chambers; and
means for operating said microwave shield means in timed relation with the operation of said conveyor means and said microwave energy introducing means to render said microwave shield means inoperative and permit dough product to move to and from said chambers when said conveyor means are operating to transfer products to and from said chambers, but preventing the escape of said microwave energy when said microwave energy introducing means is operating;
said proofing chamber including:
a first proofing chamber section having an inlet and an outlet;
and a second proofing chamber section having an inlet and an outlet;
said cooking chamber having an inlet and an outlet;
said conveyor means including:
first conveyor means for successively receiving dough product at the inlet of said first proofing chamber section and conveying it through said first and second proofing chamber sections and discharging the proofed dough product at the outlet of said second proofing chamber section; and
second conveyor means for receiving the proofed dough product from said first conveyor means and moving it from the inlet of said cooking chamber section to the outlet of said cooking chamber section; and
means is provided for introducing microwave energy into said first proofing chamber section and said cooking chamber;

said microwave shield means being movable between removed positions and shielding positions covering the inlets and outlets of said first proofing chamber section and said cooking chamber to prevent the escape of microwave energy;

means is provided for operating said first and second conveyor means at a predetermined speed to move dough from the inlet toward the outlet of said first proofing chamber section, transfer partially proofed dough from said first proofing chamber section to said second proofing chamber section, transfer proofed dough from said second proofing chamber section to said cooking chamber, and remove the cooked product from said cooking chamber;

means is provided for moving said microwave shield means between said shielding and removed positions in timed relation with the operation of said conveyor means to permit dough product to move through said inlets and outlets when said conveyor means are operating at said predetermined speeds, but covering said inlets and outlets when said conveyors are not operating at said predetermined speeds; and

means is provided for preventing operation of said microwave means when said shield means are in said removed positions.

3,881,404

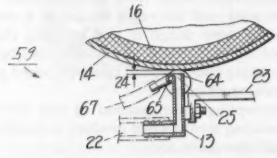
DOUGH PROCESSING DEVICE

Nobuyoshi Ohkawa, Amagasaki, Japan, assignor to Daieigiken, Inc., Amagasaki, Japan

Filed Mar. 12, 1974, Ser. No. 450,492

Int. Cl. A21c *3/04*; **A21b** *1/42*

U.S. Cl. 99—353 **1 Claim**



1. A dough processing device, for the preparation of rolled food consisting of a mixture of minced vegetables, meat and the like, wrapped in a sheet of dough of predetermined size, the device comprising a heated, rotatable drum having a substantially smooth outer circular surface; a flat nozzle to which dough is supplied and which deposits the dough through an outlet orifice onto said circular surface during the rotation of said drum; a tube being disposed substantially parallel and contiguous with a rim of said orifice; and cooling-water supply and circulating means for said tube, thereby to cool the dough emerging from said orifice, producing water droplets, and thus preventing the dough from sticking to said nozzle, said orifice and said circular surface of the drum.

3,881,405

ENERGY SOURCE FOR GENERATING AN ELECTROMAGNETIC FLUX

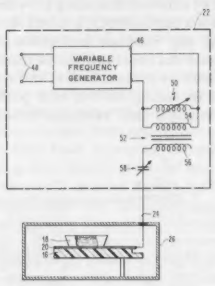
Beniamino P. Morando, Edificio Manaure, Oficinia 52, Piso 5, Sabana Grande, Caracas, Venezuela

Filed Mar. 6, 1973, Ser. No. 338,588

Int. Cl. A23c *19/00*

U.S. Cl. 99—452 **15 Claims**

7. An energy source for providing an electromagnetic flux having a high voltage and a relatively high frequency to milk, comprising a metal container having milk located therein comprising, in combination, variable frequency generator means having input and output terminals for receiving an input voltage and frequency and for generating a different output voltage and frequency; load means connected to the output terminals of said variable frequency generator means; power transformer means having a primary winding connected to said load means and having a secondary winding for



generating a high output voltage; and adjustable capacitor means connected to said secondary winding of said power transformer means for adjusting the amplitude of the output signal of said energy source, a conductive lead connecting said adjustable capacitor means to said metal container.

3,881,406

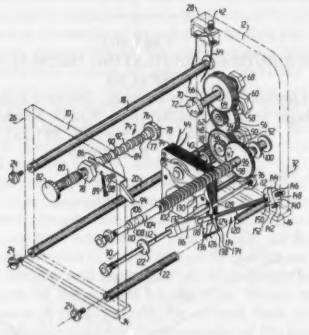
APPARATUS FOR PEELING FRUIT OR VEGETABLES

Artemio R. Perez, 14540 S.W. 284th St., Leisure City, Fla. 33030

Filed Nov. 28, 1973, Ser. No. 419,655

Int. Cl. A47j *17/04*, *43/28*

U.S. Cl. 99—594 **2 Claims**



1. An apparatus for peeling fruit and the like comprising:

A. a frame and an encompassing cover;

B. means operatively mounted in said frame for rotatably and releasably holding a piece of fruit for rotation about an axis thereof;

C. a rotatably mounted shaft having a worm gear segment thereon and mounted for rotation in said frame, the gearing of said segment having spaced threads;

D. drive means attached to said frame operable for simultaneously rotating the worm gear shaft and the fruit holding means including;

i. a drive motor; and

ii. a gear train interconnecting an output shaft of said motor and said shaft and said fruit holding means;

E. a guide bar pivotally mounted in said frame;

F. a paring blade mounting rod;

G. means slidably attaching said mounting rod on said guide bar with the mounting rod extending laterally thereof;

H. a curved closed nose flexible paring blade mounted on said blade mounting rod, said blade being arcuately swingable upon pivoting movement of said guide bar, and translationally movable upon sliding of said mounting rod, the curved nose portion being adjustably engageable with the fruit for depth of cutting into the peel thereof;

I. a worm gear engaging arm pivotally attached to said mounting rod, said arm having a compound curvilinearly shaped edge engaging the spaces between said worm gear segment threads and operable to translate said paring blade mounting rod and blade thereon upon rotation of said worm gear and said fruit holding means;

J. spring means adjustably resiliently retaining said shaped edge of said engaging arm in said spaces between the threads of said worm gear segment; and

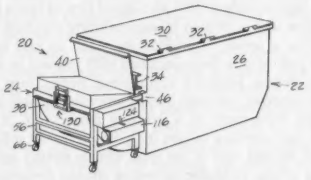
K. said compound curvilinearly shaped edge being resiliently retained in driving engagement with said worm gear segment threads by the shape thereof as said paring blades moves along the axis of a fruit being peeled and swings outwardly and inwardly during resiliently engaged peeling contact of said paring blade due to curvature of the fruit.

3,881,407

WASTE REDUCTION EQUIPMENT

James D. Goar, 9 Skylark Dr., Larkspur, Calif. 94939

Filed July 16, 1973, Ser. No. 379,656
Int. Cl. B30b *13/00*
U.S. Cl. 100—35 **17 Claims**



14. A method for compacting and storing waste material, said method comprising,

a. moving a portable packing mechanism into a position in which a movable platen of the packing mechanism is movable down through a top opening and through a charging chamber of a storage box,

b. swinging the platen upwardly about a pivot on one edge to uncover the opening in the charging chamber for loading of waste materials into the charging chamber,

c. closing the opening by swinging the platen downward about said pivot,

d. latching the packing mechanism to the storage box in the closed position,

e. powering the platen downward about the pivot to eject and compact the material from the charging chute into the storage box,

f. repeating steps (b) through (e) until the storage box is filled with compacted material, and

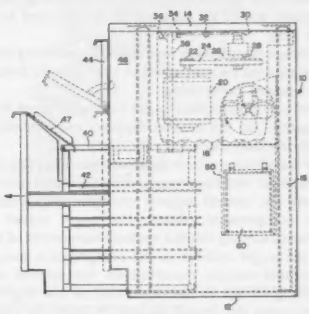
g. disconnecting the packing mechanism from the storage box.

3,881,408

COMPACTOR AND FILTER SYSTEM

Ben J. Valor, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation of Ser. No. 273,693, July 21, 1972, abandoned. This application Feb. 20, 1974, Ser. No. 444,032
Int. Cl. B30b *15/14*
U.S. Cl. 100—53 **18 Claims**



3. A compactor comprising:

a. a compactor housing having a top, a base and sides extending between said top and base,

b. a receptacle movable between a compacting position within said housing and a noncompacting position displaced therefrom,

c. a ram mounted in said housing in opposition to said receptacle,

d. drive means for moving said ram in a compacting operation into and out of said receptacle in compacting an retracting strokes,

e. a filter communicating with the interior of said housing,

f. means for circulating air in said housing to cause odor laden air within said housing to contact and be deodorized by said filter, and

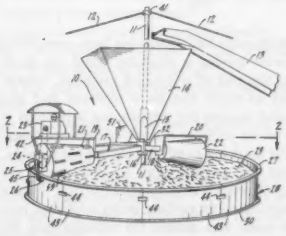
g. an air circulating control coordinated with actuation of said ram for energizing said air circulating means at a higher speed when said ram is moved in a compacting stroke.

3,881,409

SILAGE COMPRESSION APPARATUS

Ugo Luciano Frigieri, Modena, Italy, assignor to Tulio C. Luisada, Hinsdale, Ill.

Filed Feb. 21, 1974, Ser. No. 444,306
Claims priority, application Italy, Mar. 29, 1973, 40026/73
Int. Cl. A01f *25/04*; **B65g** *3/04*
U.S. Cl. 100—68 **9 Claims**



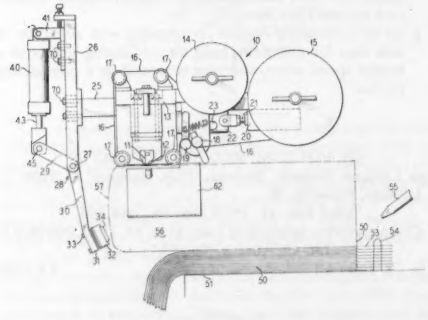
1. A silage compression apparatus for compressing forage into a compact cylindrical stack, comprising:

a central upright support;
a confining ring, disposed in encompassing relation to the central support, for confining compressed forage;
compression means, rotatably mounted on and vertically movable on the central support, for compressing forage deposited within the confining ring;
compression drive means for rotating the compression means about the central support;
ring elevation means for raising the confining ring to accommodate added increments of compressed forage within the ring;
and forage distribution means for distributing forage across a stack area encompassed by the ring, the forage distribution means comprising;
at least one distribution auger having an input end rotatably mounted on the central support and extending substantially radially outwardly thereof;
auger travel connection means interconnecting the distribution auger and the compression means to rotate the auger about the central support synchronously with rotation of the compression means, the auger travel connection means allowing limited vertical movement of the free end of the auger relative to the compression means;
and funnel means, mounted on the central support, for feeding forage to the input end of the auger, the auger conveying the forage outwardly from the center toward the periphery of the ring and continuously levelling the stack formed within the ring.

3,881,410
INFLATED BAG PRINTER HAVING THE ANVIL MOUNTED ON A BELL CRANK

James L. Shenoha, Lockport, Ill., assignor to Norwood Marking & Equipment Company, Downers Grove, Ill.

Continuation-in-part of Ser. No. 358,962, May 10, 1973, Pat. No. 3,823,664. This application Oct. 26, 1973, Ser. No. 410,096. The portion of the term of this patent subsequent to July 16, 1991, has been disclaimed.
Int. Cl. B41f *17/00*
U.S. Cl. 101—41 **4 Claims**

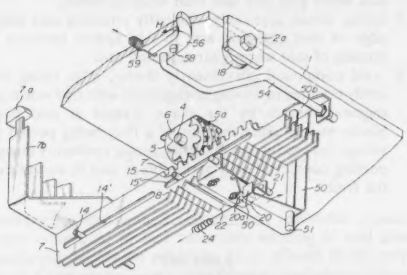


1. In an apparatus for imprinting bags comprising an imprint marker device having a marking head, an anvil, said anvil attached to the end of a moving member, means for moving the member to move the anvil towards and away from the marking head, means for positioning a bottom wall of a bag inflated by an air jet from a stack of deflated bags between the anvil and the marking head, the means for moving, moving the anvil against the bottom wall to collapse a portion of the inflated bag to press a first surface portion thereof against the marking head, the first surface being adjacent, non-opposed to the bottom wall, and means for withdrawing the anvil from contact with the bag, the improvement of the anvil being attached to one end of a bell crank, the means for moving being a prime mover being attached to an opposite end of the bell crank, the bell crank pivotally attached to a frame member, movement of the prime mover causing the anvil to move toward and away from the marking head.

3,881,411
TYPE WHEEL ARRESTING AND BLOCKING DEVICE

Yasuo Araki; Fumiyuki Mishima, and Kenzi Tsukahara, all of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Aug. 3, 1973, Ser. No. 385,602
Claims priority, application Japan, Feb. 16, 1973, 48-19644
Int. Cl. B41f *1/08*
U.S. Cl. 101—45 **10 Claims**



1. Type wheel arresting and blocking device comprising supporting means; a set of type wheel means, each type wheel means including a type wheel having a series of types and a gear fixedly secured to said type wheel, each type wheel means being mounted on said supporting means for angular movement to bring a selected type to a printing position; setting means including a set of rack bars having a series of rack teeth meshing with said gears, said rack bars being movable in longitudinal direction for selectively turning and setting said type wheels so that an aligned row of types represents information and is placed in said printing position, said rack bars having a series of projections, each of said projections having a pair of side faces inclined with respect to each other so as to define between subsequent projections V-shaped arresting recesses; carriage means mounted on said supporting means for movement in a printing stroke out of an initial position, said carriage means including a platen roller moving over said aligned row of set type wheels during said printing stroke; a single yieldable arresting means mounted on said supporting means for movement between an arresting position and an inoperative position, said arresting means including a single arresting member extending across said rack bars and a single arresting spring permanently biasing said arresting member into selected recesses of all rack bars to engage in said arresting position the sides faces of the projections defining said selected recesses to maintain the types set by said setting means in printing position, said arresting means resiliently yielding to said inoperative position by moving at least one of said rack bars in longitudinal direction during setting the respective type wheel means and thereby pushing said arresting member out of the recess by the inclined side face of the respective projection; blocking means having a blocking position engaging and blocking said arresting member in said arresting position so that said type wheels are blocked in an exact position, and an inoperative position spaced from said arresting means; biasing means for urging said blocking means to said blocking position; and linkage means connecting said carriage means with said blocking means for holding, in said initial position of said carriage means, said blocking means in said inoperative position against the action of said biasing means so that the type wheel means can be set with said arresting means resiliently yielding, and for releasing said blocking means during the printing stroke of said carriage means so that the blocking means is moved by said biasing

means to said blocking position and said type wheel means are blocked against displacement by said platen roller or by said setting means.

3,881,412

PRINTER FOR DATA PROCESSING MACHINES

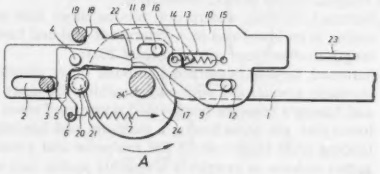
Paul Thevis, Oberndorf (Neckar), Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Nov. 13, 1973, Ser. No. 415,448

Claims priority, application Germany, Nov. 18, 1972, 2256666

Int. Cl. B41j *9/26*

U.S. Cl. 101—93.48 **10 Claims**



1. In a printer for use with a data processing machine, the printer being composed of: a plurality of type carriers each settable to print a respective type character; a printing arm arranged for movement in a direction to cause each type carrier to effect a printing operation; and power storage means operatively associated with said printing arm to provide operating power to drive said printing arm in a manner to produce a printing operation, the improvement comprising coupling means operatively disposed between said printing arm and said power storage means and including: lever means mounted for pivotal movement about a pivot bearing on said printing arm and having one end connected to said power storage means; actuating means movably mounted on said printing arm and arranged for limiting the pivotal movement of said lever means until completion of a printing operation and for releasing said lever means upon completion of such operation; and an abutment member arranged for further limiting the movement of said lever means during such printing operation, said abutment member lying in an area between the pivot bearing and the connection of said lever means to said power storage means.

3,881,413

PIVOTING ROTARY SCREEN END RING MOUNT

Mathias Mitter, Senne, Germany, assignor to Mitter & Co., Schloss Holte, Germany

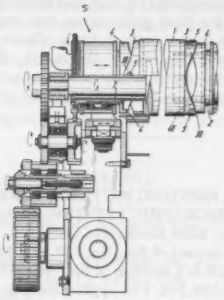
Filed Nov. 8, 1973, Ser. No. 413,991

Claims priority, application Germany, Nov. 9, 1972, 2254819

Int. Cl. B41f *15/38*; B41n *1/24*

U.S. Cl. 101—127.1 **7 Claims**

1. In a screen printing machine, a combination comprising a tubular printing screen having spaced axial ends; a support adjacent each of said ends; a pair of mounting rings each fixed to one of said axial ends; a pair of journal ring units each fixedly mounted on one of said supports; and two pivot joints each connecting one of said mounting rings with a respectively associated journal ring unit, said pivot joints together forming a multi-directional pivot mount which allows said tubular printing screen to yield in response to fluctuations in the



spacing which exists between said tubular printing screen and material which is being printed upon.

3,881,414

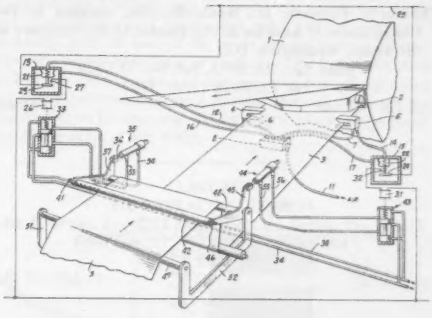
APPARATUS FOR CONTROLLING THE LATERAL POSITION OF AN ELONGATED WEB

Salvatore F. D'Amato, Floral Park, and Chauncey P. Foote, Jr., Katonah, both of N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 390,001

Int. Cl. B41f *9/14*

U.S. Cl. 101—156 **4 Claims**



1. A printing press, comprising:

a. wiping means for removing ink from the surface of an inked intaglio plate, comprising:

1. an elongated web movable longitudinally;
2. a pad for holding a portion of the web against the surface of the rotating cylinder;
3. means for guiding the web between said pad and the cylinder; and
4. means for controlling the lateral position of the web, comprising:
   - i. two edge sensing means;
   - ii. means supporting said two edge sensing means at the opposite edges of said web;
   - iii. two motors, each controlled by one of said edge sensing means;
   - iv. two fixed guide means extending across and engaging the web and spaced longitudinally of the web, said two guide means defining a straight run for the web;

v. third guide means extending across and spaced from but movable into engagement with the web between the two fixed guide means; and

vi. means controlled by each said motor for moving one end of the third guide means into engagement with the web so that each motor is effective upon operation thereof to change the length of the path traversed by one edge of the web as compared to the length of the path traversed by the other edge.

3,881,415

PROCESS FOR PRINTING WITH NON-FERROUS METAL LITHOGRAPHIC PRINTING PLATES

James E. Harper, 6804 Border Pl., Oxon Hill, Md. 20022

Continuation-in-part of Ser. No. 250,297, May 4, 1972, abandoned, which is a division of Ser. No. 819,110, April 4, 1969, Pat. No. 3,696,746. This application Aug. 20, 1973, Ser. No. 389,563

Int. Cl. B41m *4/100*

U.S. Cl. 101—451 **2 Claims**

1. A process for treatment of a non-ferrous lithographic printing plate in a planographic printing process comprising applying to said printing plate a fountain solution containing an alkali metal phosphate glass in the proportion of from 50–300 grams of a said alkali metal phosphate glass to 1,000 cc of water, said solution containing an acid of phosporous to provide a pH of from 5 to 7; said solution being diluted in the ratio of 1 part solution to 30 to 60 parts of water when introduced into the press fountain.

3,881,416

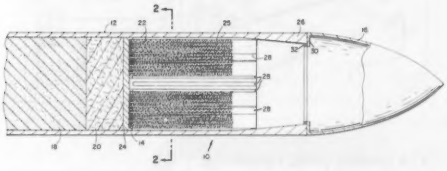
CHOKED FLECHETTE WEAPON SYSTEM

Thomas E. Dilworth, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 23, 1973, Ser. No. 353,930

Int. Cl. F42b *13/48, 7/00*

U.S. Cl. 102—63 **1 Claim**



1. A flechette weapon system for ejecting at high velocity a plurality of flechettes from a warhead of a missile comprising: a launch tube in said missile, one end of said launch tube having a smaller inner diameter than the remainder of the tube; an ogive tip for closing said launch tube, said ogive tip having an inwardly extending flange and a depending collar thereon for mating with said launch tube; a container for stacking said flechettes in said launch tube; said container being provided with a plurality of slots around its periphery to allow inner compression of the container as it passes through said smaller inner tube diameter; an ejection piston disposed in said launch tube engaging said container and said flechettes and pressurizing means in said launch tube to provide pressure for actuating said ejection piston and ejecting said flechettes.

3,881,417

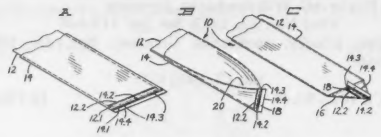
BLAST HOLE LINER WITH INTEGRAL WEIGHT POCKET

Charles R. Mesia, Mt. Iron, Minn., assignor to Mesabi Jobbers, Inc., Virginia, Minn.

Filed Nov. 9, 1973, Ser. No. 414,145

Int. Cl. F42d *3/00*

U.S. Cl. 102—22 **18 Claims**



1. A reinforced, waterproof, flat-storable blast hole liner with integral weight pocket comprising:

a flattened, flexible, waterproof, tubular inner tube terminating at its lower end in a waterproof seal and having a length-to-diameter ratio of at least **20/1;**

a flattened, flexible, waterproof, tubular outer sheath substantially coextensive with and sheathing the inner tube, and having a separate heat-sealed waterproof seam at its lower end, the seam having a midpoint and laterally extending ends folded about the midpoint and joined together to form an exteriorly accessible pocket into which weighting material may be placed, the inner tube extending into close proximity with the seam of the sheath and conforming to the configuration of the pocket.

3,881,418

CARTRIDGE FOR SHOTGUN

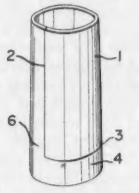
Hiroshi Sato; Bunji Yoshida, and Kenji Sumikawa, all of Aichi, Japan, assignors to Nihon Yushi Co., Ltd., Aichi Prefecture, Japan

Filed Nov. 23, 1973, Ser. No. 418,243

Claims priority, application Japan, Nov. 24, 1972, 47-17162

Int. Cl. F42c *7/08*

U.S. Cl. 102—42 C **10 Claims**



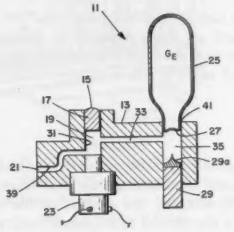
1. A cartridge for a shotgun shell, comprising a one-piece cylindrical shot container having an annular sidewall which is open at one end and defines therein a shot compartment which is of converging tapered configuration as it extends inwardly from said one end, said shot container also having a base fixedly connected to the other end of said sidewall for closing said compartment, said sidewall being tapered in the longitudinal direction thereof so that the thickness thereof increases as it extends longitudinally from the one end to the other end thereof, said sidewall having a first slit formed therein and extending longitudinally thereof, said first slit extending from the one end of said sidewall to a location disposed adjacent to other end thereof, the sidewall also having a second slit formed therein and extending circumferentially thereof, said second slit communicating with said first slit at said location and being positioned at the other end of said sidewall whereby said second slit is disposed directly adjacent the inside surface of said base, said second slit ex-

tending peripherally of said sidewall throughout substantially the complete periphery thereof except for a small connecting portion which fixedly connects said sidewall to said base, and the shot compartment as defined within said container being filled with iron shot.

3,881,419
PYROTECHNIC INITIATOR

Gayle A. Bea, Mountain View, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1973, Ser. No. 412,509
Int. Cl. F42c *15/28*
U.S. Cl. 102—70 R **7 Claims**



1. A pyrotechnic initiator comprising in combination:

a. at least one means for storing and containing an explosive gas;

b. at least one means for controlling the flow of the explosive gas;

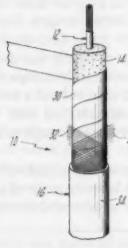
c. a secondary explosive in contact with the flow of the explosive gas; and

d. a means for igniting said explosive gas and said secondary explosive.

3,881,420
SMOKE CORD

John Mitchell Smith, Simsbury, and Hector Joseph Zilcosky, Litchfield, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Continuation-in-part of Ser. No. 183,164, Sept. 23, 1971, abandoned. This application July 13, 1973, Ser. No. 379,175
Int. Cl. C06d *3/00*
U.S. Cl. 102—90 **8 Claims**

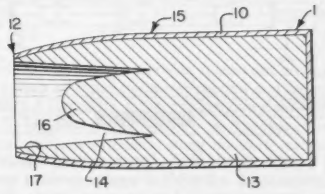


1. In a pyrotechnic fume generating cord having substantial flexibility and a length to diameter ratio of at least about 50:1, said cord being adapted to be coiled and spliced and comprising an elongated igniter stem extending along the length of the cord, a fume generating pyrotechnic charge in abutting relationship with said stem along its length and capable of being ignited by said igniter stem and a covering circumscribably confining both said charge and said stem along the length thereof, the combination wherein said pyrotechnic charge is a flameless smoke generating charge, said igniter stem is an incendiary composition encased within said charge and adapted to progressively burn with a short flame zone for initiating confined combustion of said flameless smoke generating charge without rupturing said covering and said covering includes a yarn wrapping and an outer plastic sheath exhibiting sufficient structural integrity to provide limited confined flameless combustion of said charge and to promote complete combustion of said charge and improved smoke generation, said cord having a combustion time of up to about 20 feet per second.

3,881,421
BULLET

Thomas J. Burczynski, 111 Roosevelt Ave., Horseheads, N.Y. 14845

Filed Feb. 14, 1974, Ser. No. 442,421
Int. Cl. F42b *11/00*
U.S. Cl. 102—92.2 **4 Claims**

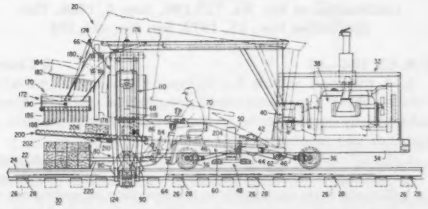


1. A bullet comprising a body of relatively soft material terminating at its forward end in a blunt nose of ogival form, the forward end of the body having a cavity formed therein and extending coaxially into the body to a substantial depth, and a center-piece of substantial mass coaxially extended forwardly from the base of the cavity toward but not substantially beyond the blunt nose of the body of the bullet, the outer wall of the center-piece and the opposing wall of the cavity defining therebetween a deep annular channel or trench terminating at its bottom near the transverse plane of the shoulder of the ogive of the bullet.

3,881,422
TIE REPLACING SYSTEM

John F. Bryan, Jr., 3212 Mapleleaf Cir., Dallas, Tex. 75233

Filed Dec. 27, 1972, Ser. No. 319,004
Int. Cl. E01b *29/06*
U.S. Cl. 104—9 **67 Claims**



1. A process for replacing worn ties in a railroad track of the type comprising longitudinally extending metal rails supported on transversely extending wooden ties by metal tie plates and a ballast roadbed supporting and at least partially enclosing the ties including the steps of:

removing the portions of a worn tie which project above the tie plates;

advancing a tie pushing-tie pulling member along a path extending substantially axially of the worn tie and thereby

pushing the worn tie out from beneath the tie plates and the rails and out of the roadbed of the railroad track;

securing a replacement tie to the tie pushing-tie pulling mechanism;

retracting the tie pushing-tie pulling mechanism along substantially the same path and thereby pulling the replacement tie into position in the roadbed and beneath the tie plates and the rails of the railroad track.

3,881,423

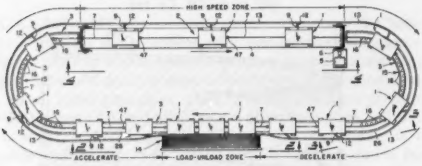
VARIABLE SPEED VEHICLE

Harry E. Woods; Gerald L. Woodling, both of Akron, and Newton D. Brown, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 307,579, Nov. 17, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 464,845

Int. Cl. A63g *1/00*

U.S. Cl. 104—25 **7 Claims**



1. A variable speed vehicle for an endless train driven along a continuous track, a flexible elongated member between said variable speed vehicle and an adjacent vehicle of said train, and a rotatable reel mounted on said variable speed vehicle and responsive to actuation from said track for winding and unwinding of said elongated member to change the length of said elongated member between said variable speed vehicle and said adjacent vehicle, said reel reducing the length of said connecting means between said variable speed vehicle and said adjacent vehicle by pulling said variable speed vehicle and said adjacent vehicle closer together and said reel increasing the length of said connecting means by permitting said variable speed vehicle and said adjacent vehicle to be pulled further apart whereby acceleration, deceleration and different speeds of said variable speed vehicle can be obtained at predetermined portions of the track.

3,881,424

STORAGE AND RETRIEVAL ARRANGEMENT

Harry W. Thompson, Chicago, Ill., assignor to Interlake, Inc., Chicago, Ill.

Division of Ser. No. 230,788, March 1, 1972, which is a continuation of Ser. No. 98,193, Dec. 14, 1970, which is a continuation of Ser. No. 737,199, June 4, 1968. This application Nov. 16, 1973, Ser. No. 416,385

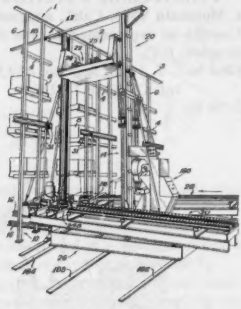
Int. Cl. B60s *13/02*

U.S. Cl. 104—48 **8 Claims**

6. A transport vehicle for transporting a second movable vehicle along a predetermined longitudinal path of travel substantially perpendicular to the normal longitudinal path of travel of said second movable vehicle,

a plurality of first support means supporting said transport vehicle at a plurality of locations spaced a predetermined distance from each other in the direction of movement of said second movable vehicle along said normal path of travel, said first support means supporting said transport vehicle for movement along said predetermined path of travel,

a plurality of second support means supporting said second movable vehicle at a plurality of locations also spaced from each other in the direction of movement of said second movable vehicle along said normal path of travel, by a distance substantially equal to said first mentioned distance and supporting said second movable vehicle for movement both relative to and independently of said transport vehicle, said second spaced support means being simultaneously substantially vertically alignable with respective ones of said first support means both in the direction of movement of said transport vehicle and second movable vehicle in said predetermined and normal paths of travel respectively, when said second movable vehicle is positioned on said transport vehicle for transport, whereby the weight of the second movable vehicle is distributed substantially entirely to said vertically aligned first support means and deflection of said transfer vehicle is minimized.



3,881,425

PUMP FOR USE IN A CAPSULE TRANSPORT PIPELINE

Marion R. Carstens, Atlanta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed May 30, 1973, Ser. No. 365,051

Int. Cl. B61d *13/10*

U.S. Cl. 104—138 R **24 Claims**

1. In a mass transportation system including a series of cars, conduit means for guiding said cars along a selected path and means for flowing air at a selected rate through said conduit means, the improvement wherein said means for flowing air includes pump means having an inlet for withdrawing air at one point from said conduit means and having an outlet for injecting air at another point into said conduit means, said points being spaced apart along the direction of air flow to define a car by-pass section, and means for causing said pump means to withdraw and inject air at a rate at least normally at a rate greater than said selected rate whereby to create a tendency for reverse air flow through said car by-pass section; and

holding means in opposition to said tendency for reverse air flow for causing at least one car of said series at a time to reside temporarily within said car by-pass section.

3,881,426

DOFFER MECHANISM CARRIAGE

Kenneth H. Long, Charlotte, N.C., assignor to Whitin Machine Works, Inc., Charlotte, N.C.

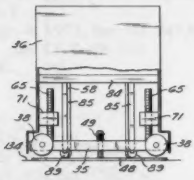
Filed Nov. 23, 1973, Ser. No. 418,753

Int. Cl. B61c *13/00*

U.S. Cl. 105—28 **6 Claims**

1. A transporter unit for a textile spindle doffing machine comprising a carriage frame having wheels adapted to roll along a surface, a main frame carried on said carriage frame

and vertically movable with respect thereto, a turntable carried by said carriage frame and vertically movable with respect thereto, and means selectively operable in one mode to elevate said main frame and turntable with respect to said



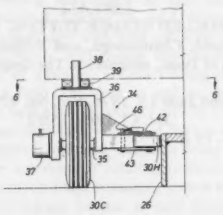
carriage frame and allow said transporter unit to roll on said wheels and operable in another mode to lower said main frame and said turntable with respect to said carriage frame and allow said main frame and said carriage frame to rotate about said turntable.

3,881,427

MONORAIL CAR AND WHEEL ASSEMBLY

Lowell R. Blume, 1902 Mallard, Houston, Tex. 77043

Filed Dec. 3, 1973, Ser. No. 421,287
Int. Cl. B61b *13/04*
U.S. Cl. 105—141 **5 Claims**



1. A monorail car assembly for operation on a road surface extending from either side of a central monorail having parallel vertical guiding surfaces wherein said central monorail has a short radius of curvature in curved sections, said car assembly comprising

elongated car body means having a longitudinal center line, at least one pair of supporting wheels where each of the supporting wheels are located at opposite sides of said center line at one end of said car body means,

means individually journaling each of said supporting wheels for rotation about a horizontal axis,

means on each of said journaling means for individually providing a pivot connection along a first vertical axis of rotation, said first vertical axis intersecting a respective horizontal axis of a supporting wheel, said pivot connection for each supporting wheel being free to pivot independently of the pivot function of said other supporting wheels,

a pair of guide wheels for each of said supporting wheels,

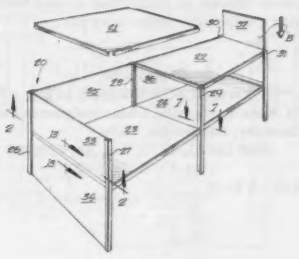
guide frame means on each of said individual journaling means for journaling each of said pairs of guide wheels for rotation about a vertical axis, each pair of said guide wheels being located relative to a supporting wheel in a plane to one side of a first vertical axis and disposed fore and aft of such vertical axis, each said pair of guide wheels being engageable with a vertical guiding surface of a monorail thereby to permit tracking of each such supporting wheel independently of one another relative to said central monorail.

3,881,428

SHELVING UNIT

John J. Klecki, Antioch, Ill., assignor to Quaker Industries, Inc., Antioch, Ill.

Filed Nov. 5, 1973, Ser. No. 412,688
Int. Cl. A47b *17/02*
U.S. Cl. 108—27 **7 Claims**



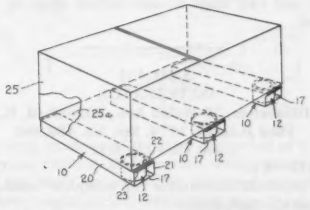
1. A shelving structure comprising at least one elongated leg member having an outer perimeter section and an inner perimeter section inset with respect to the outer perimeter section to form at least one leg flange, a margined shelf member having skirt portions extending along the shelf margin and a cutaway corner portion adapted to mate with only a portion of said leg inner perimeter section for orienting the shelf margin adjacent to, but spaced apart from, the leg flange by a predetermined distance, said predetermined distance between the leg flange and the shelf skirt substantially equalling the thickness of a panel member thereby permitting the insertion of the panel member between the leg flange and the shelf margin and retention of the panel member between the leg flange and the shelf margin, and shelf-leg connecting means for mounting the shelf to the leg at a predetermined location.

3,881,429

PALLET RUNNER

Ralph J. Seymore, 301 Washington Ave., Greenville, S.C.

Filed Aug. 24, 1972, Ser. No. 283,376
Int. Cl. B65d *19/20*
U.S. Cl. 108—51 **2 Claims**



1. A pallet runner for use in a disposable pallet assembly for shipping articles stacked thereon having a single rectangular section of carboard having fluting consisting essentially of:

A. a single row of aligned cylindrical fiber cores spaced across and centrally disposed on said rectangular section of cardboard with a base portion of each of said cores glued to said rectangular section of cardboard;

B. said cores being aligned in a direction across said fluting of said carboard;

C. a first pair of centrally disposed parallel scores spaced a distance substantially equal to the diameter of said cores aligned with said cores forming a base for said runner;

D. a second pair of scores parallel to said first scores and spaced outwardly therefrom a distance substantially

equal to the height of said cores forming sides for said runner;

E. marginal flaps having a width substantially equal to the diameter of said cores; and

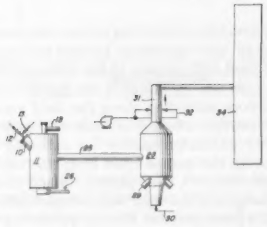
F. an upper portion portion of each of said cores to which said flaps are folded down and glued forming a beam like runner having a flat double thickness of carbdoard for gluing to a bottom portion of an article carrying member; whereby a plurality of such pallet runners may be glued in spaced relation to each other to said bottom portion forming a disposable pallet assembly.

3,881,430

TWO-STAGE INCINERATOR

Howard M. Katz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 3, 1973, Ser. No. 420,888
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 F **2 Claims**



1. A two-stage contiguous incinerator comprising:

a. a first stage comprising a vaporization zone, at least one first burner, at least one forced air supply, inlet for waste materials, outlet for gaseous products,

b. a bed of catalyst within said vaporization zone,

c. a second stage comprising a combustion zone, at least one second burner, at least one second forced air supply, entrance for receiving gaseous products from said first stage, outlet for combusted gaseous products from said second stage,

d. connecting conduit for conducting vaporous products from said first stage to said second stage by confined means.

3,881,431

INCINERATOR

Sabatino DiSabatino, 29 Waldo Ave., Bloomfield, N.J. 07003

Filed June 19, 1974, Ser. No. 480,904
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 C **8 Claims**

1. An improved incinerator for complete combustion of waste materials comprising:

a base housing;

an elongated casing member mounted on said housing and defining a primary combustion chamber;

steel grates mounted along the base of said primary combustion chamber;

perforated fire brick mounted on said steel grates, said grates and brick forming a fixed grate on which said waste materials are burned and through which resultant ash can fall;

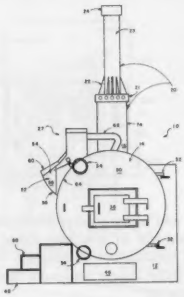
means to collect and remove said ash;

means to load waste materials into said primary combustion chamber;

a stack assembly unit mounted on said primary combustion chamber;

an afterburner unit mounted at the base of said stack assembly unit;

an aspirator ring mounted in said stack assembly unit above said afterburner;



a spark arrester mounted on top of said stack assembly;

a fan and ducts connected thereto to supply air to the primary combustion chamber and the afterburner;

an air control system to maintain a negative air pressure in said primary combustion chamber to insure a slow smoldering smokey non-turbulent fire therein;

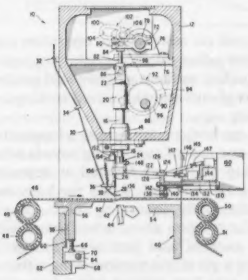
means to supply power and fuel to said incinerator.

3,881,432

CONTROLLED NEEDLE TUFTING MACHINE

Connie W. Dodd, Chattanooga, and William D. Stone, East Ridge, both of Tenn., assignors to The Singer Company, New York, N.Y.

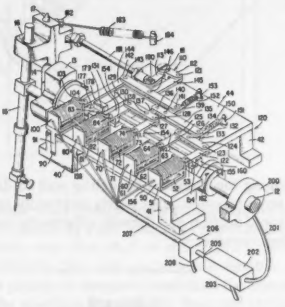
Filed June 13, 1974, Ser. No. 479,021
Int. Cl. D05c *15/32*
U.S. Cl. 112—79 R **4 Claims**



1. In a controlled needle tufting machine, means for supporting a workpiece, a needle bar, means for reciprocating said needle bar, a yarn carrying needle, means for selectively coupling said needle to said needle bar for reciprocating said needle through said workpiece, stop means spaced above said needle, means urging said needle against said stop means when not coupled to said needle bar, means spaced below said workpiece supporting means for cooperating with said needle to form pile extending from the lower face of said workpiece, means for vertically adjusting said workpiece supporting means to vary the pile height, means for vertically adjusting the stroke of the reciprocating needle bar without changing the bottom point in the stroke, and means for adjusting the vertical position of the stop means corresponding to the

change in stroke of the needle bar so that the needle may be coupled to the needle bar at each adjusted stroke.

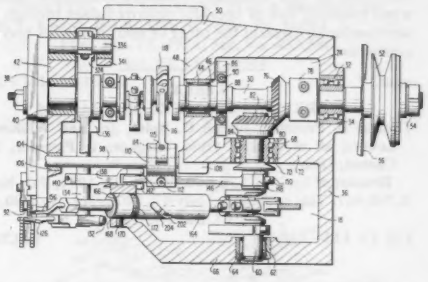
3,881,433
ELECTRO-MECHANICAL ACTUATOR
Donald R. Davidson, S. Orange, N.J., assignor to The Singer Co., New York, N.Y.
Filed Apr. 4, 1973, Ser. No. 347,982
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 E **5 Claims**



1. In a sewing machine having a frame, stitch-forming instrumentalities in said frame, and actuating mechanism for imparting stitch-forming movement of said stitch-forming instrumentalities, control linkage in said sewing machine frame operatively associated with said stitch-forming instrumentalities for selectively influencing the production of a variety of patterns of stitches, an electromagnetic locking device comprising a field coil element and an armature element, said elements being free to shift relatively to each other in one predetermined direction when said field coil element is not electrically actuated, and said elements being urged magnetically toward an interlocked relative position when said field coil element is electrically actuated, means for interconnecting said control linkage to one of said electromagnetic locking device elements, means for supporting the other of said electromagnetic locking device elements relatively to said sewing machine frame, mechanism driven in timed relation with said sewing machine actuating mechanism for vibrating one of said electromagnetic device elements in said predetermined direction into and out of said interlocked relative position, and means for selectively energizing said field coil element electrically during each vibration of said electromagnetic device elements into said interlocked relative position.

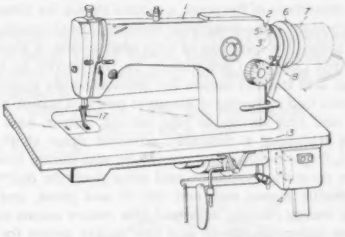
3,881,434
OVEREDGE SEWING MACHINE CONSTRUCTION
Edward A. Kelly, Wethersfield, Conn., assignor to The Merrow Machine Company, Hartford, Conn.
Filed Apr. 26, 1973, Ser. No. 354,714
Int. Cl. D05b *1/20, 57/34*
U.S. Cl. 112—162 **24 Claims**

1. In an overedge sewing machine including a housing, a horizontal work support on said housing, feed means for feeding a workpiece in intermittent increments over said work support past a stitching station, cooperating stitch forming elements including a needle, a lower looper and an upper looper, separate mounting means supporting said needle, said lower looper, and said upper looper for independent movement, and a drive means for operating said feed means and said cooperating stitch forming elements in synchronization to form an overedge seam along the edge of a workpiece as it is fed past said stitching station, the improvement wherein said drive means comprises, in combination, a horizontal main drive shaft extending through said housing and mounted therein for rotation about an axis extending substantially perpendicular to the direction of feed of the workpiece over said work support, an auxiliary drive shaft mounted within said housing for rotation about a horizontal axis extending at right angles to said main drive shaft, gear means connecting said main drive shaft and said auxiliary drive shaft for simultaneous rotation about their respective axes, first, second, and



third articulated bar linkage mechanisms each mounted in a fixed plane within said housing and operable within their respective planes to drive said cooperating stitch forming elements, said first, said second and said third bar linkage mechanisms each operably connecting one of said cooperating stitch forming elements to one of said shafts to be driven thereby.

3,881,435
ARRANGEMENT FOR DETECTING THE POSITION OF THE SEWING NEEDLE IN A SEWING MACHINE
Hachiro Makabe, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed May 4, 1973, Ser. No. 357,322
Claims priority, application Japan, May 9, 1972, 47-53900
Int. Cl. D05b *69/22*
U.S. Cl. 112—219 A **9 Claims**



1. In a sewing machine of the type comprised of a sewing needle, a main rotating shaft, means interconnecting said needle and said shaft for converting rotational movement of said shaft into longitudinal reciprocating movement of said needle, a hollow drive pulley fixedly mounted on one end of said main shaft, and a drive arrangement for driving said main shaft including a drive belt trained around said hollow drive pulley, an arrangement comprising magnet means mounted inside said hollow drive pulley for rotation therewith; flux-responsive means; and mounting means mounting said flux-responsive means on a stationary part of the sewing machine with such an orientation relative to the path of motion of said magnet means that when said drive pulley assumes a predetermined angular orientation corresponding to a predetermined position of said needle a flux-responsive voltage is induced in said flux-responsive means, wherein said flux-responsive means comprises Hall generator means including a Hall generator semiconductor element having a pair of control elec-

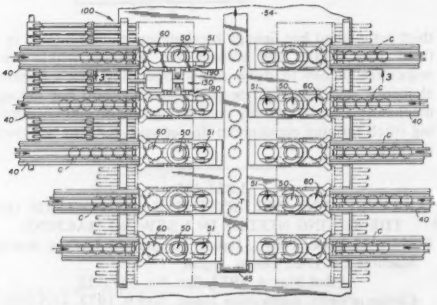
trodes and a pair of Hall-voltage electrodes; and further including current source means connected across said control electrodes for establishing flow of a control current through said Hall generator semiconductor element; and a detecting circuit comprising a pair of transistors and means so connecting the electrodes of said transistors to the electrodes of said Hall generator semiconductor element that when magnetic flux of one polarity passes through said semiconductor element one of said transistors becomes conductive whereas when magnetic flux of opposite polarity passes through said semiconductor element the other of said transistors becomes conductive.

3,881,436

WORKPIECE TRANSFER MECHANISM

Thomas B. Paumier; Joseph D. Bulso, Jr., and William R. Lewers, all of Canton, Ohio, assignors to Paumier, Inc., Canton, Ohio

Division of Ser. No. 126,860, March 22, 1971, Pat. No. 3,768,667. This application July 17, 1973, Ser. No. 380,071
Int. Cl. B21d *43/10*
U.S. Cl. 113—115 **13 Claims**



1. In a redraw press receiving at least one row of continuously fed cups to be redrawn and trimmed into a finished can, a first station for drawing the cups into cans upon the downward movement of the press, a second station for trimming the cans upon the same downward movement of the press, escapement means for each row of cups placing one of the continuously fed cups into position to be transferred to said first station, and transfer means for simultaneously transferring a cup from said escapement means to said first station and a can from said first station to said second station, said transfer means including a rotatably powered drive shaft, shuttle means, finger mechanisms carried by said shuttle means, first rocker means activated by said drive shaft for reciprocating said shuttle means into and out of said press, and second rocker means rocking with said first rocker means as well as rocking independently of said first rocker means for moving said finger mechanism transversely of said shuttle means to selectively grip and release the cups and cans.

3,881,437

METHOD OF MAKING POP-IN CONTAINER CLOSURE

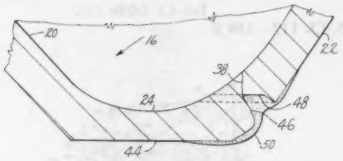
Walter C. Lovell, 348 Mountain Rd., and Frederick G. J. Grise, 12 Maiden Ln., both of Wilbraham, Mass. 01095

Continuation-in-part of Ser. No. 331,844, Feb. 12, 1973, abandoned. This application Mar. 25, 1974, Ser. No. 454,384
Int. Cl. B21d *51/00*
U.S. Cl. 113—121 C **10 Claims**

1. The method of making a manually disruptable pop-in type of button closure for a planar metal container lid comprising:

a. depressing the lid in a generally closed, continuous path to provide an integral button portion having inner and outer bounding walls respectively including opposed parallel surfaces inclined to the plane of the lid,

b. shear-coining one of the bounding walls to form a lengthwise indentation in one of said inclined surfaces thereof and concommitantly produce a fractured but integral section extending between the other of said surfaces and the bottom of the indentation for a portion of its length, and then



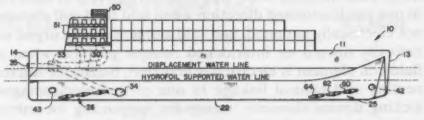
c. swedging the indented bounding wall to dilate a face of the indentation at least partly outwardly relative to said fractured section and thereby effectively lock the closure to the container lid.

3,881,438

SEMI-DISPLACEMENT HYDROFOIL SHIP

Allen Jones, Jr., 5028 Lauderdale Ave., Virginia Beach, Va. 23455

Filed Aug. 10, 1972, Ser. No. 279,714
Int. Cl. B63b *1/18*
U.S. Cl. 114—66.5 H **11 Claims**



1. A displacement hull ship comprising:

a. a hull having a generally T-shaped cross section;

b. said hull having side walls with upper and lower portions joined by intermediate portions;

c. said upper portions extending substantially vertically and being spaced apart along the majority of their length by a substantially constant first distance;

d. said lower portions extending substantially vertically and being spaced apart along the majority of their length by a substantially constant second distance which is about one third of said first distance, said lower portions extending substantially the full length of said hull and being operable to define a usable space in the lower portion of said hull whereby the displacement of said lower portions contributes a significant amount of buoyancy to the ship;

e. said intermediate portions providing inclined transition surfaces connecting said upper and lower portions;

f. said portions being of such configuration as will give the ship a displacement waterline near the juncture of said upper and intermediate portions;

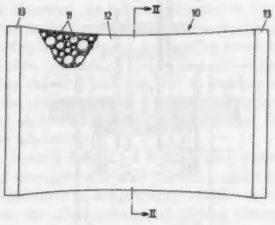
g. a plurality of hydrofoils disposed along said lower portions for raising the hull in the water when the ship is underway such that the cruising waterline during cruising is near the juncture of said lower and said intermediate portions; and,

h. said hydrofoils being positioned below said cruising waterline.

3,881,439
BUOYANCY BODY

Erik V. Svanholm, Skurusundsvagen 35, S-130 10 Ektorp, Sweden

Filed June 12, 1973, Ser. No. 369,145
Claims priority, application Sweden, June 15, 1972, 7862/72
Int. Cl. B63b *43/00*
U.S. Cl. 114—69 2 Claims

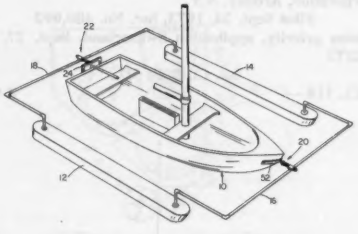


1. A buoyancy body comprising a multiplicity of individual pieces of a substantially rigid buoyancy material having density substantially less than that of water and a hermetically sealed substantially flat and rectangular flexible envelope enclosing the pieces of buoyancy material, the absolute pressure within the envelope being lower than one atmosphere at sea level, but higher than 0.8 atmosphere, at temperatures between 0° and 25°C.

3,881,440
SAILING VESSEL

Scott Mason, P.O. Box 369, Wakefield, R.I. 02880

Continuation-in-part of Ser. No. 183,357, Sept. 24, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 397,969
Int. Cl. B63b *43/14*
U.S. Cl. 114—123 4 Claims



1. In a trimaran having a central hull, two outrigger hulls and means connecting said hulls to each other to permit pivotal movement of the central hull about its longitudinal axis relative to said outrigger hulls so as to heel to the wind with respect to said outrigger hulls in the manner of a single hull sailing vessel, the improvement wherein:

said connecting means comprise relatively rigid connecting members pivoted to fore and aft portions of the central hull and extending between the central hull and each outrigger hull and including

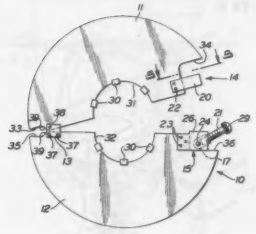
resilient means acting between the central hull and said rigid connecting members arranged to resist heeling motion of said central hull in either direction and exert a restorative force which increases with the degree of heeling motion of said hull, and

said connecting means including longitudinal rigid rods, one of which extends forwardly of the bow of the central hull and the other of which extends aft of the stern of the central hull and both of which are rigidly connected to the central hull so as to pivot therewith and which are further journaled in said rigid connecting members, and wherein said resilient means comprise springs acting between said rigid rods and said rigid connecting members.

3,881,441
TROLLING ATTACHMENT FOR A PROPELLER

John F. Kader, 464 E. 33rd St., Erie, Pa. 16504

Filed Jan. 15, 1974, Ser. No. 433,580
Int. Cl. B63b *25/44*
U.S. Cl. 114—145 A 3 Claims



1. A trolling attachment for a boat comprising

a circular disk made up of two semi-circular members each having a semi-circular oepning formed therein,

hinge means connecting said semi-circular members together to form said circular disk, having a concentric circular opening in the center,

said concentric circular opening being adapted to receive the hub of an outboard motor,

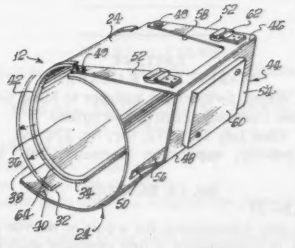
resilient members spaced around the inside of said opening for frictionally engaging a spinner,

and a clamping means for clamping said two semi-circular halves to said hub.

3,881,442
MOTOR MOUNT FOR AN INFLATABLE BOAT

Ronald L. Seiple, Kailua, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,039
Int. Cl. B63b *7/08*
U.S. Cl. 115—.5 B 7 Claims



1. A motor mount for an inflatable boat of the type having a flat bottom, bow, and inflatable side and stern tubular gunwale sections comprising:

a resilient coiled plate which, in its relaxed condition, is capable of receiving the stern gunwale in a deflated condition;

said coiled plate being capable of expanding outwardly when the stern gunwale is inflated into its tubular form inside the coiled plate;

said coiled plate upon expansion tightly engaging both bottom and top surfaces of the flat bottom of the boat so that the coiled plate becomes rigidly mounted to the boat; and means mounted to the coiled plate for receiving a boat motor.

3,881,443

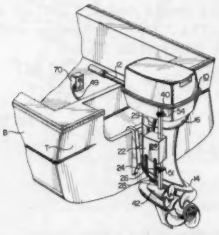
OUTBOARD PROPULSION TROLLING ASSEMBLY

John K. Hamp, Rt. 1, Box 462, Hot Springs, Ark. 71901

Filed Mar. 6, 1974, Ser. No. 448,628

Int. Cl. B63h *21/26*

U.S. Cl. 115—18 E **10 Claims**



1. An improved propulsion means for mounting on the transom of a boat, comprising:

a. a main outboard motor pivotally mounted on said transom and operative for driving and steering the boat at cruising speeds;

b. an electric outboard motor for driving the boat at trolling speeds;

c. means connecting the outboard motor to the main outboard motor so that the former steers in unison with the latter;

d. a mounting assembly for supporting the electric outboard motor including a shaft extending upwardly from the electric motor, a fixed supporting frame receiving said shaft above the motor and supporting it in vertically reciprocable relationship to the frame, and means for raising and lowering the shaft so that the electric motor will selectively occupy an up position with the motor out of the water and a down position with the motor in the water; and

e. limit switches on the frame and including an up limit switch connected to disable the electric motor and a down limit switch connected to disable the main outboard motor.

3,881,444

MARINE DRIVE GEARING

Hans Sigg, Widen, Switzerland, assignor to Maag Gear Wheel & Machine Company, Zurich, Switzerland

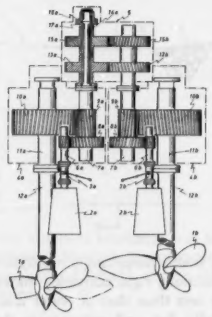
Filed July 10, 1972, Ser. No. 270,461

Claims priority, application Germany, July 13, 1974, 2134972

Int. Cl. B63h *5/08*

U.S. Cl. 115—37 **5 Claims**

1. Drive gear transmission for a pair of marine propellers comprising, in combination, a first propeller shaft for one of the propellers and a second propeller shaft for the other one of the propellers, respective drive means for rotating said first and second propeller shafts, and respective trains of drive gears connected to and rotated by said drive means, said gear trains being connected to said shafts to transmit the drives of said respective drive means to said first and second propeller shafts, mechanical interconnection means coupling said first and second propeller shafts together so that said propeller shafts rotate in synchronism, said interconnection means comprising a first gear interconnection and a second gear interconnection arranged in parallel and intermeshed engagement, preloading means associated with at least one of said first and second gear interconnections for applying opposite



preloading torques to said first and second gear interconnections, each said drive gear train comprising an intermediate shaft, the gearing of said train connecting said intermediate shaft to said drive input means and to said propeller shaft, the respective intermediate shafts having said interconnection means secured to them, and said first and second gear interconnections each comprising a pair of gear wheels.

3,881,445

APPARATUS FOR SEQUENTIALLY EVACUATING AND IMPREGNATING A TEXTILE WEB

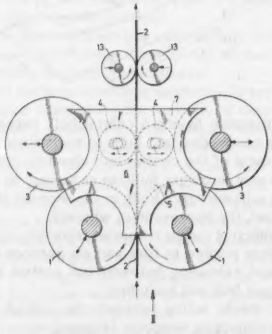
Otto Nothiger, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,092

Claims priority, application Switzerland, Sept. 27, 1972, 14102/72

Int. Cl. B05c *3/12*

U.S. Cl. 118—4 **4 Claims**



1. An apparatus for the sequential evacuation and impregnation of a textile web, including:

a vacuum chamber defined by a pair of opposed side walls and first and second sets of rollers disposed between said side walls with the end faces of each roller in sealing relationship with respecti[illegible] ones of said side walls and in

each set adjacent rollers being in sealing contact with one another, each set of rollers comprising a first and a second roller and at least one roller intermediate said first and second rollers and spaced from the path of a web through said vacuum chamber, first and second rollers of said first set being disposed adjacent first and second rollers, respectively, of said second set to provide, respectively, inlet and outlet pairs of rollers for guiding a textile web into and out of, respectively, said vacuum chamber, at least one roller of said sets being arranged as a driven roller for longitudinally moving a textile web through said vacuum chamber, at least one roller in each set being journalled in bearings movable in a direction transverse to the roller axis whereby the sealing force on the roller is adjustable, and at least one of said side walls comprising a member movably mounted for movement in the direction of the roller axes whereby the sealing force between said one side wall and the adjacent end faces of said rollers is adjustable;

automatic control means for moving said movable bearing and said movable side wall member, said control means being responsive to the pressure in said vacuum chamber to adjust the aforementioned sealing forces in dependence thereon; and

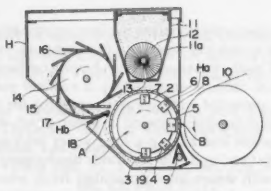
an impregnation vessel at least partially defined by surface portions of said pair of outlet rollers external of said vacuum chamber and adjacent portions of said side walls whereby a textile web leaving the nip of said outlet rollers passes into said impregnation vessel.

3,881,446

MAGNETIC BRUSH DEVELOPING APPARATUS

Takaji Kurita, Kawachinagano, and Takao Fujiwara, Sakai, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1974, Ser. No. 434,114
Claims priority, application Japan, Jan. 25, 1973, 48-10756
Int. Cl. G03g *13/08*
U.S. Cl. 118—637 **7 Claims**



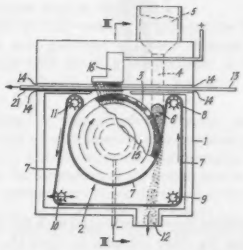
1. A magnetic brush developing apparatus for developing an electrostatic latent image which comprises a housing structure with an opening adjacent to a photoreceptor surface, a magnetic brush developing roller provided at the lower part of said housing and adjacent to said photoreceptor surface, a toner powder supplying means provided above said developing roller, a vaned cylinder having a plurality of outwardly extending vanes which form buckets for transporting developer material rotatably provided close to the surface of said developing roller and a used developer material sump provided under said vaned cylinder, the majority of developer material on said developer roller being scraped off by vane tips of said vaned cylinder, carried upward in said buckets, and subsequently emptied into said used developer sump for mixing and diffusing of said developer material as said vaned cylinder rotates.

3,881,447

ELECTROSTATIC APPLICATION OF THERMOPLASTIC ADHESIVE

Hans W. Rebentisch, Frankfurt, and Gerhard W. Steinmeyer, Hunoldstal, Taunus, both of Germany, assignors to USM Corporation, Boston, Mass.

Filed Aug. 27, 1973, Ser. No. 392,034
Claims priority, application Germany, Oct. 31, 1972, 2253444
Int. Cl. G03g *13/06*
U.S. Cl. 118—638 **9 Claims**



1. A device for the application of a powder melt adhesive in the form of a strip onto a backing material, which strip is to be subsequently used to adhere the backing, comprising:

a rotatable member,

means for containing a powder melt adhesive on an arcuate portion of said rotatable member,

stationary electrode means in spaced relation with said arcuate portion of said rotatable member,

means for limiting the quantity of powder melt adhesive contained on said portion of said rotatable member when disposed in the area of said stationary electrode,

other electrode means integral with said rotatable member, and

means for applying a voltage of predetermined polarity to said stationary electrode and a voltage of opposite polarity to said other electrode to establish a high tension electrical field across said space between said stationary electrode said arcuate portion of said rotatable member whereby particles of the powder melt adhesive are drawn toward said stationary electrode and deposited as a strip onto a backing material fed through said space between said stationary electrode and said arcuate portion of said rotatable member by the force of the energy exerted by the established field.

3,881,448

MILKING VALVE

Olof A. Hallstrom, 1350 Hallstrom Rd., Tillamook, Oreg. 97141

Filed Nov. 23, 1973, Ser. No. 418,670
Int. Cl. A01j *3/00*
U.S. Cl. 119—14.19 **10 Claims**

1. A milking valve comprising

a. a valve component including

1. a valve body having a longitudinal passageway therethrough,

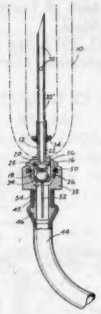
2. a valve member in the valve body normally closing said passageway, and

3. a hollow inlet tube extending from the valve body and adapted for insertion through the opening defined by the sphincter muscle of an udder teat, and

b. a coupler component including

1. a hollow valve coupler body arranged for removable connection to the valve body and adapted for commu-

nication with a milk collection receptacle, and

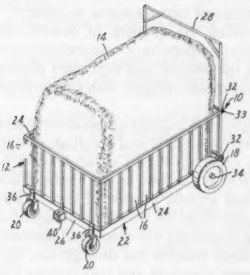


2. valve actuating means associated with the coupler body for moving the valve member to open the passageway upon connection of the coupler body to the valve body.

3,881,449
STACK FEEDING DEVICE

Theodore W. Burrack, and Gary F. Burrack, both of Farmersburg, Iowa 52047

Filed Apr. 25, 1973, Ser. No. 354,171
Int. Cl. A01k *5/00*
U.S. Cl. 119—60 **4 Claims**



1. A feeding device for restricting the waste of feed materials being fed to cattle from a stack of the feed material on the ground, said device comprising:

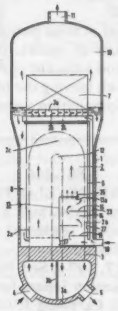
a rigid frame having four generally vertical walls, each wall comprising a lattice of spaced structural members defining a plurality of openings, each of which openings is adapted to receive the head of one of said cattle and is sufficiently narrow that structural members will abut and restrict passage of the shoulders of said cattle, three of said walls being assembled welded into a generally U-shaped portion of said frame having spaced ends defining an open side adapted to receive the stack and including a rigid brace comprising vertical and horizontal members bridging between said ends and adapted to pass over the stack received in said U-shaped portion, with the fourth wall being sufficiently long to span said open side and having one end pivotably mounted on one of the ends of said U-shaped portion for movement between a position from said open side and a closed position across the open side; and including means for releasably and rigidly latching said fourth wall in the closed position; and

means for movably supporting the U-shaped portion of the frame on the ground adapted, when said fourth wall is in said open position, to allow movement of the U-shaped portion about a said stack, and after said fourth wall is then moved to the closed position, to allow movement of the frame relative to the stack within said frame by the force exerted by cattle reaching through said openings to reach the stack.

3,881,450
STEAM GENERATOR

Hans Mayer, Bubenreuth, and Heinz-Jurgen Schroeder, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 12, 1973, Ser. No. 369,192
Claims priority, application Germany, June 26, 1972, 2231235
Int. Cl. F22b *1/06*
U.S. Cl. 122—32 **6 Claims**



1. A pressurized-water coolant nuclear reactor steam generator including a vertical housing containing an inverted U-shaped nest of heat-exchanging tubes having coolant inlet and outlet ends and radially enclosed by a vertical guide jacket having its top provided with a water separator for the generated steam, said housing forming a water down-draft space around said jacket and having a feed water inlet adjacent to said nest's outlet end and said separator discharging separated water mixed with steam into a chamber from which it flows into the upper level portion of the steam-generating water fed into said housing, and a preheater receiving heat from said nest's outlet end and through which feed water from said inlet is conducted for preheating before introduction to said steam-generating water; wherein the improvement comprises means for feeding a portion of the required feed water without preheating to said chamber and mixing it with said separated water and steam in amounts condensing substantially its steam content.

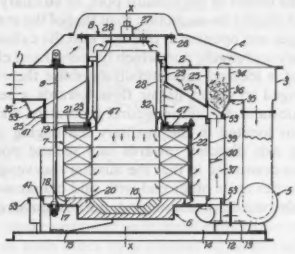
3,881,451
FLUID HEATERS

Peter R. Smith, Crawley, England, assignor to Stone-Platt Crawley Limited, Sussex, England

Filed Dec. 6, 1973, Ser. No. 422,504
Claims priority, application United Kingdom, Dec. 20, 1972, 58700/72
Int. Cl. F22b *27/08*
U.S. Cl. 122—250 R **17 Claims**

1. A fluid heater comprising in combination

a. a base assembly,
b. a heat exchange assembly supported above said base assembly,
c. a fuel combustor assembly positioned so that substantially its entire weight is supported upon the upper portion of said heat exchange assembly,
d. said heat exchange assembly being
1. adapted to carry the fluid to be heated, and
2. being positioned to receive the hot combustion gases from said fuel combustor,



e. a wall member surrounding at least part of said heat exchange assembly, which wall member serves to confine and channel the hot combustion gases after the hot combustion gases have passed through said heat exchange assembly, said wall member being substantially non-load bearing with respect to said fuel combustor in the sense that the wall member can be removed for purposes of cleaning or inspection of the heat exchange assembly without the need to move either the heat exchange assembly or the fuel combustor assembly.

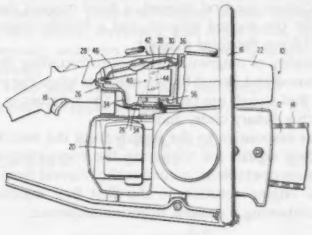
3,881,452

METHOD AND APPARATUS FOR OPERATING AN ENGINE-DRIVEN CHAIN SAW IN AN ENVIRONMENT WHERE ICE MAY FORM IN THE CARBURETOR OF THE ENGINE

John Lewis Dilworth, Santa Monica, and John Louis Zimmerer, Torrance, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed Jan. 22, 1973, Ser. No. 325,346
Int. Cl. F02b *75/12*
U.S. Cl. 123—1 A **1 Claim**

1. A method for operating a chain saw in an environment where ice may be formed in a carburetor means thereof, and wherein said chain saw comprises:
a two-cycle, internal combustion, chain saw engine;
a cutter chain drivenly engaged with said chain saw engine;
reservoir means connected to said chain saw engine and operable to contain a combustible lubricating oil-gasoline mixture for transmittal to a carburetor means;
carburetor means for transmitting a volatile mixture of air and said lubricating oil-gasoline mixture therethrough for passage to a combustion chamber of said chain saw engine; and
said carburetor means having an interior portion including an induction passage;
said method comprising:
a. storing an ice inhibiting means with a lubricating oil composition,
b. maintaining a ratio of said ice inhibiting means to said lubricating oil composition so as to ensure that when said lubricating oil composition is added at a predetermined lubricating ratio to said gasoline, a ratio of ice inhibiting means to gasoline will automatically be provided which will substantially prevent the formation of ice when said gasoline is drawn through said induction passage with air at a temperature of less than about 40°F and having a relative humidity of greater than about 50%,
c. concurrently mixing said lubricating oil composition and ice inhibiting means with gasoline to provide a combustible lubricating oil-gasoline mixture containining an ice inhibiting means mixed therewith, and simultaneously
i. condition said gasoline for effective lubrication and combustion in said two-cycle, internal combustion chain saw engine, and
ii. condition said gasoline to prevent the formation of ice when said gasoline is drawn through said induction passage with air at a temperature of less than about 40°F and having a relative humidity of greater than about 50%,
d. providing, in said reservoir means, said combustible lubricating oil-gasoline mixture containing an ice inhibiting means mixed therewith and operable to substantially prevent the formation of ice within said induction passage of said carburetor means during operation of said chain saw engine in an environment where ice may be formed in said carburetor means and where said mixture is drawn through said induction passage with air at a temperature of less than about 40°F and having a relative humidity greater than about 50%;
e. operating said chain saw engine to pass said combustible mixture through said carburetor means of said chain saw engine and thereby introduce said ice inhibiting means into said induction passage of said chain saw engine to substantially inhibit a formation of ice therein and prevent an ice blockage in said induction passage when said chain saw engine is operated in an environment where ice may be formed in said carburetor means, and where said mixture is drawn through said induction passage with air at a temperature of less than about 40°F and having a relative humidity greater than about 40%;
f. said combustible lubricating oil-gasoline mixture, containing said ice inhibiting means, being contained within said reservoir means during said operation of said chain saw while being subject to chain saw operation-induced vibration;
g. said volatile mixture of air and lubricating oil-gasoline mixture being transmitted through said induction passage of said chain saw engine carburetor means with said ice inhibiting means while said induction passage is subject to said chain saw operation-induced vibration; and
h. said volatile mixture of air lubricating oil-gasoline mixture, including said ice inhibiting means, being transmitted from said induction passage through a crank case of said chain saw engine prior to combustion of said volatile mixture in said combustion chamber of said chain saw engine.

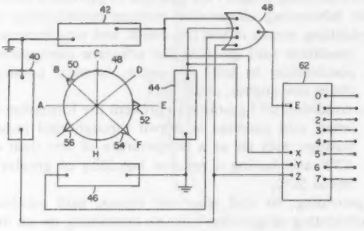


3,881,453

ELECTRONIC FUEL INJECTION TRIGGERING MEANS

Peter W. Harper, and Leslie Confair, both of Royal Oaks, Mich., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Oct. 1, 1973, Ser. No. 402,434
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA **6 Claims**



1. In combination with a fuel system having computing means for providing a fuel injection command signal to control the actuation of injector valve means whereby the injection of fuel to an internal combustion engine is controlled, means for triggering the computing means comprising:

a rotor rotating with the engine crankshaft and having disposed thereon a first magnet, a second magnet disposed 90° from the first magnet, a third magnet disposed 135° from the second magnet and a fourth magnet disposed 45° from the third magnet;

a plurality of magnetic switches surrounding the rotor and opened and closed by the magnets when the rotor rotates so that signals are provided by the switches in accordance with a binary code; and

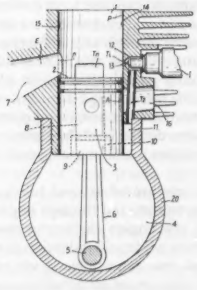
means responsive to the signals from the switches for providing signals for triggering the computing means, said means operable to minimize the interval from the start of the engine rotation to the first fuel injection and for maintaining a desired injection sequence.

3,881,454

TWO STROKE ENGINE CONSTRUCTION

Eric E. Jaulmes, Paris, France, assignor to Ateliens de La Motobecane

Continuation-in-part of Ser. No. 297,861, Oct. 16, 1972. This application Mar. 8, 1974, Ser. No. 449,446
Int. Cl. F02b *33/07*
U.S. Cl. 123—73 B **10 Claims**



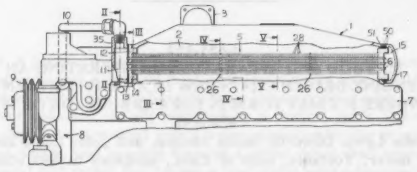
1. In a two stroke combustion engine of the crankcase compression type, including a cylinder, a piston disposed in the cylinder for reciprocal motion therein, a sealed crankcase, air intake passage means communicating with said crankcase through an air intake port, an exhaust port which is open in the side wall of the cylinder and opened and closed by the piston, at least two main scavenging passages communicating said crankcase with the cylinder through at least two main scavenging ports which are open in the side wall of the cylinder and opened and closed by the piston, said main scavenging ports being disposed symmetrically with respect to a diametral plane of the cylinder passing through the center of the exhaust port, and so directed that the air flows therefrom coverage towards a first point located on a first generatrix of the cylinder diametrically opposite to a second generatrix passing through the center of the exhaust port, an auxiliary scavenging passage of smaller cross-section than that of the main scavenging passages and opening at one end into the cylinder through an auxiliary scavenging port which is opened and closed by the piston and is located substantially opposite the exhaust port and arranged to direct its air flow towards a second point located substantially on the second generatrix, and fuel injection means located in the auxiliary scavenging passage and having its axis directed towards said second point, the improvement consisting in that the auxiliary scavenging passage communicates at its other end with said crankcase at least as long as the auxiliary scavenging port is uncovered by the piston.

3,881,455

AFTERCOOLER FOR INTERNAL COMBUSTION ENGINE

James F. Belsanti, Blue Island, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 31, 1973, Ser. No. 411,475
Int. Cl. F01p *11/00*
U.S. Cl. 123—119 CD **10 Claims**

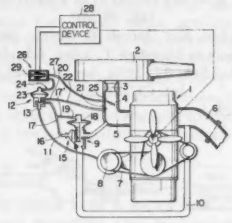


1. An internal combustion engine having at least one cylinder comprising, an intake manifold including means defining a supercharger air discharge chamber for receiving air from a supercharger, an intake passage communicating with said cylinder, a core supporting section intermediate said air delivery chamber and said intake passage including manifold core supporting walls defining inner surfaces, an aftercooler core including a pluraiity of fluid conduits extending the length of said manifold, a plurality of core supporting plates embracing said plurality of conduits and defining peripheral surfaces for engaging the inner surfaces of said manifold core supporting walls of said intake manifold, a plurality of cooling fins interleaved between said supporting plates forming cooling air passages through said aftercooler core, means defining coolant fluid chambers at the ends of said aftercooler core for circulating coolant fluid through said core for cooling of intake air supplied to said internal combustion engine.

3,881,456
EXHAUST GAS RECIRCULATION SYSTEM

Hidetaka Nohira, and Kiyoshi Kobashi, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 29, 1974, Ser. No. 474,351
Claims priority, application Japan, May 30, 1973, 48-59711
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **4 Claims**



1. An exhaust gas recirculation system in which the exhaust system and intake system of an internal combustion engine are connected to each other by a conduit so as to recirculate a part of exhaust gas from the exhaust system into the intake system, said system comprising:

a pressure control unit provided in said conduit and having a fixed throttle,

a pressure chamber and valve arranged successively in that order in the direction from the exhaust system to the intake system,

a pressure control section comprising:

a first chamber communicated with said pressure chamber,

a second chamber separated from said first chamber by a diaphragm and communicated with a pressure source and also with the atmosphere, and

a valve assembly secured to said diaphragm and adapted to control communication between said second chamber and said pressure source,

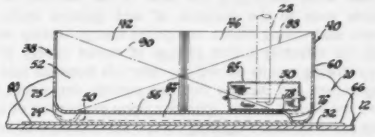
and a controlled pressure chamber communicated with said second chamber in said pressure control section and compartmented by a diaphragm joined to said valve in said pressure control unit, whereby compressed air supplied into said second chamber in said pressure control section from said pressure source is released into the atmosphere corresponding to pressure in said pressure chamber to control pressure in said chamber in the pressure control section, and said valve in the pressure control unit is operated responding to the thus controlled pressure so as to maintain pressure in said pressure chamber substantially equal to atmosphere pressure.

3,881,457
FUEL PICK-UP BAFFLE

Robert J. Benner, Lansing, and Roger J. Lundquist, Grand Ledge, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 9, 1974, Ser. No. 468,500
Int. Cl. B65d *87/12*
U.S. Cl. 123—136 **4 Claims**

1. A fuel supply system comprising a tank having means including a tank bottom to define a main fuel chamber, a baffle container having a base located on the bottom of said tank, said container having a generally rectangular configuration to define a second fuel chamber within said tank, said baffle container including an upper open end and a peripheral sidewall having a height less than that of said tank, a fuel pick-up tube having an inlet end thereof located adjacent the base of said baffle container for drawing fuel from said second chamber, a pair of parallel conduits extending diagonally of said baffle container base, one of said conduits including an inlet located outside of one corner of said baffle container within said main tank and including an outlet located inside of an opposite corner of said baffle container, the other of said conduits including an inlet located outside of said opposite corner and including an outlet therefrom located inside of said one corner, said conduits serving to fill said second chamber with fuel from said main tank chamber when the fuel supply

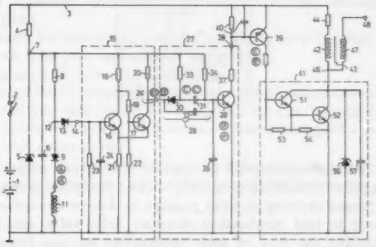


in the main tank is below the height of said sidewall and dynamic forces on the fuel supply are balanced, fuel within said conduits being responsive to vehicle maneuvers to produce a back pressure against fuel flow from within said secondary chamber to said main fuel chamber thereby to maintain an assured supply of fuel to the fuel pickup tube during vehicle maneuvers wherein a minimum fuel supply in the main tank is located out of communication with the fuel pickup tube.

3,881,458
IGNITION SYSTEM DEPENDENT UPON ENGINE SPEED

Herman Roozenbeek, Schweiberdingen; Bernd Bodig, Leinfelden; Klaus Meyer, Daverden, and Adolf Fritz, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 12, 1973, Ser. No. 396,517
Claims priority, application Germany, Sept. 13, 1972, 2244781
Int. Cl. F02b *1/02*
U.S. Cl. 123—148 E **13 Claims**



1. In the ignition system of an internal combustion engine comprised of at least one electrical igniting element operative for producing an ignition spark once per ignition cycle, in combination, an ignition transformer having a secondary winding connected across said igniting element and having a primary winding; means for establishing a flow of current through said primary winding and including electronic switch means in the current path of said primary winding operative for, controlling the flow of current through said primary winding; crankshaft-synchronized triggering means operative for generating a train of crankshaft-synchronized triggering pulses; monostable control means connected to said electronic switch means and having a trigger input connected to said triggering means for receipt of said triggering pulses, and operative when triggered into the unstable state thereof for rendering and maintaining said switch means non-conductive for the duration of said unstable state, whereby to interrupt the flow of current through said primary winding and induce across said secondary winding a voltage surge causing said

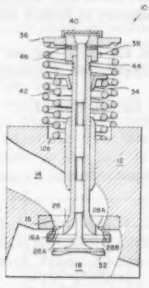
igniting element of produce an ignition spark, and operative upon reverting to the stable state thereof for rendering and maintaining said switch means conductive for the duration of said stable state, whereby to establish a build-up of current flow in said primary winding in preparation for the next interruption of current flow, said monostable control means including timing means operative with increasing engine speed within a predetermined range of engine speeds for automatically and progressively decreasing the duration of said unstable state while increasing the ratio of the duration of said unstable state to the duration of said ignition cycle, and wherein said timing means comprises energy-storing means, means for effecting a first change of stored ene-gy of said energy-storing means during the intervals between said triggering pulses and thereby for time periods dependent upon engine speed, and means operative upon generation of a triggering pulse by said triggering means for causing said monostable control means to undergo a transition to said unstable state and initiating an opposite second change of stored energy of said energy-storing means and maintaining said monostable control means in said unstable state until the completion of said second change of stored energy.

3,881,459

INLET VALVE FOR INTERNAL COMBUSTION ENGINE AND METHOD FOR SUPPLYING FUEL THERETO

Werner Gaetcke, 4603 Locust, Bellaire, Tex. 77401

Filed Feb. 28, 1974, Ser. No. 446,608
Int. Cl. F01l *3/06*
U.S. Cl. 123—188 R **9 Claims**



1. In combination with an internal combustion engine having a cylinder defining a variable volume combustion chamber and means defining an inlet passage to deliver a combustible mixture to said combustion chamber, inlet valve means for controlling the flow of said combustible mixture from said inlet passage to said combustion chamber, said inlet valve means comprising:

a. means defining an inlet port in said combustion chamber connecting said inlet passage with said combustion chamber, said inlet port having a portion defining a first valve seat;

b. main valve means having a main valve head moveable out of and into engagement with said first valve seat to respectively open and close said port to flow therethrough, said main valve head including means defining at least one flow passage therein for permitting the flow of said combustible mixture from said inlet passage therethrough, said main valve head further including means defining a second valve seat surrounding said at least one flow passage;

c. auxiliary valve means having an auxiliary valve head disposed for movement out of and into engagement with said second valve seat for respectively opening and closing said at least one flow passage in said main valve head to flow therethrough; and

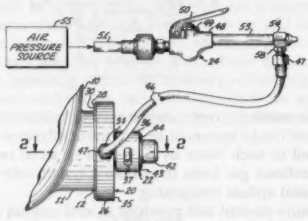
d. means for sequentially moving said auxiliary valve head out of engagement with said second valve seat and said main valve head out of engagement with said first valve seat to permit the flow of said combustible mixture from said inlet passage to said combustion chamber, first through said at least one flow passage, and second through said inlet port around said main valve head.

3,881,460

APPARATUS AND METHOD FOR PRIMING AN ENGINE OIL PUMP

Marshall T. Allen, and Darrell E. Norris, both of Glendale, Ariz., assignors to Marshall T. Allen, Glendale, Ariz.

Filed Feb. 22, 1974, Ser. No. 445,317
Int. Cl. F01m *11/10*
U.S. Cl. 123—196 S **7 Claims**



1. A method for remotely priming an oil pump in an engine comprising the steps of:

a. exposing the oil filter mounting pad of the engine to reveal the oil inlet passage from the oil pump, the oil outlet passage to the engine's lubricated parts and the oil chamber formed within said mounting pad;

b. convering the oil chamber of said mounting pad for sealing that chamber and the oil inlet passage communicating therewith against leakage and for isolating the oil outlet passage therefrom; and

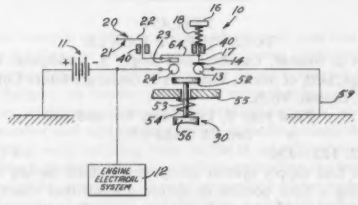
c. applying a suction to said sealed oil chamber to cause oil to move from the oil sump of the engine through the oil pump, through the oil inlet passage and through the oil chamber so that any entrapped air will be purged therefrom.

3,881,461

AUTOMATIC POWER CUT-OFF DEVICE FOR VEHICLES

Stanislaw F. Filip, 15 Vicora Linkway, Don Mills, Ontario, Canada

Filed Aug. 3, 1973, Ser. No. 385,482
Int. Cl. F02b *77/08*
U.S. Cl. 123—198 D **7 Claims**



1. An automatic power cut-off device for use with a cable operated carburetor throttle valve, said device comprising a housing having a throttle control hand operable means secured thereto, said hand operable means being spring biased against a first switch to maintain a normally closed switch contact condition, said first switch having a stationary and a

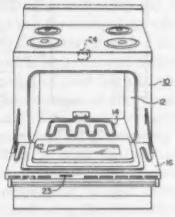
movable contact, a throttle cable connected at one end to said hand operable means for operating said throttle valve means, said throttle cable being provided with an elongated enlarged section located a predetermined distance from its connected end to said hand operable means, a second switch having a stationary contact and a movable contact, said movable contact of said second switch being resiliently biased against said throttle cable so that axial movement of said cable by displacement of said hand operable means will cause said movable contact to be displaced by said enlarged section and assume a closed contact condition with its associated stationary contact, said first switch being activated to an open contact condition prior to said activation of said second switch to a closed contact condition, said movable contact of said first and second switches being electrically connected together, one of said stationary contacts being connected to a battery and the other to ground whereby to bypass said battery to ground when both said switches are closed.

3,881,462

WINDOWED DOOR FOR A HEAT CLEANING OVEN

Eugene J. Barnett, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 1, 1974, Ser. No. 465,985
Int. Cl. F23m *7/00*
U.S. Cl. 126—197 **7 Claims**



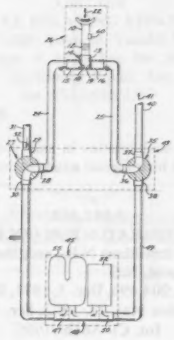
1. A cooking oven comprising:
means defining a forwardly open oven;
a door for closing said oven including at least a first panel and a second panel spaced apart from said first panel;
a window in said door including at least a pair of spaced apart panes on opposite sides of a generally planar space defined in part between said windows;
a shutter having sidewardly extending flanges positionable in said door to seat in a first position between said first panel and said second panel and movable to at least a second position in said generally planar space between said panes to obstruct viewing therethrough into said oven;
means defining guide slots disposed transverse to said panels and said panes and further defining said planar space between said panes, said slots receiving said flanges therein, said slots including means to receive said flanges in a seated relationship at said first position;
means for latching said door closed;
means for positioning said shutter within said door, said positioning means connected with said latching means to locate said shutter in said first position with said door in an unlatched condition and to draw said shutter from said first position to said second position when said door is latched closed; and
said means to receive said flanges in a seated relationship comprise lower tapers at the bottom of each of said slots, and upper tapers at a position in each slot corresponding to the top of each flange when said shutter is seated, said upper and lower tapers having oppositely directed slopes to import a tilted disposition to said shutter in its seated position.

3,881,463

RADIOACTIVE GAS INHALATOR

David E. LeMon, 11160 Poplar St., No. B, Loma Linda, Calif. 92354

Filed Apr. 26, 1972, Ser. No. 247,562
Int. Cl. A61b *5/08*
U.S. Cl. 128—2 A **4 Claims**



1. A radioactive gas inhalator apparatus comprising:
an inhalator valve having an air inlet port, an air outlet port and a mouthpiece port;
an inhalator mouthpiece connected to said mouthpiece port;
means for producing a closed breathing loop between said air inlet port and said air outlet port;
a source of radioactive material;
means for introducing a single injection of radioactive material into said closed breathing loop for causing said radioactive material to be introduced into the lungs of a patient with every breath;
said means for introducing said radioactive material comprising a self-sealing needle-pierceable diaphragm.

3,881,464

SAMPLING DEVICE AND METHOD

Max Moses Levene, 46 Cranky Gardens, Kensington, London S.W. 7, England

Filed Dec. 4, 1972, Ser. No. 311,817
Claims priority, application United Kingdom, Dec. 9, 1971, 57304/71
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 B **3 Claims**

1. A method of obtaining from the uterine cervix a sample that is suitable for both cytological and histological examination, which comprises the steps of obtaining from the uterine cervix a sample which contains both tissue and cellular material by contacting said cervix with a generally conical brush having radially projecting bristles made of soft fibres having the firm sample-retaining texture of cellulose acetate, which bristles are soluble in a solvent that does not cause morphological damage to the sample when said bristles and sample are immersed in said solvent, but are insoluble in conventional fixatives for said cells and tissues, immersing the brush having the sample thereon in a fixative for said sample, causing rela-

tive agitation between said brush and fixative to remove cellular material therefrom for cytological examination, and subse-

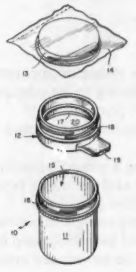
quently dissolving said bristles in said solvent to prepare a sample suitable for histological examination.

3,881,465

METHOD AND APPARATUS FOR COLLECTING URINE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Division of Ser. No. 204,496, Dec. 3, 1971, Pat. No. 3,777,739.
This application May 29, 1973, Ser. No. 365,005
Int. Cl. A61h *10/00*
U.S. Cl. 128—2 F **11 Claims**



1. A closed internally sterile device for collecting a urine specimen from a patient in a substantially uncontaminated state, said device comprising

an internally sterile container having a closed end, and, at its other end, an opening through which said urine can be directed for retention therein;

a hollow internally sterile intermediate member open at its ends and having an opening therethrough and including first coupling means being located on said intermediate member and removably securing said intermediate member to and over said container opening with the opening therethrough in unobstructed communication with said container opening

a lip portion being formed as part of said intermediate member and covering the edge of said container opening to protect it from contamination when said intermediate member is removably secured to said container, and

second coupling means located on said intermediate member and displaced from said first coupling means, one open end of said intermediate member nearest said second coupling means forming one edge of said intermediate member;

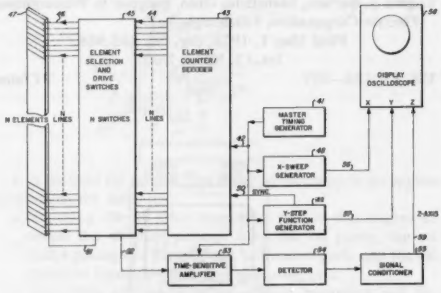
an internally sterile cap member removably secured to said second coupling means of said intermediate member to cover said one edge of said intermediate member and to close said opening thereof and thereby the opening of said container to which said intermediate member is removably secured, said cap member having means for removably securing it to said container opening over said opening and its edge to close said container when said intermediate member has been removed from said container.

3,881,466

ULTRASONIC CROSS-SECTIONAL IMAGING SYSTEM

Martin H. Wilcox, Franktown, Colo., assignor to Advanced Diagnostic Research Corporation, Tempe, Ariz.

Filed Aug. 20, 1973, Ser. No. 389,958
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 V **1 Claim**



1. In a real-time ultrasonic cross-sectional imaging system, said system including

timing generator means for generating a pulsed electrical signal,

transducer means for

generating a pulsed ultrasonic energy beam in response to said electrical signal,

transmitting said pulsed ultrasonic beam into a heterogenous body,

receiving echos reflected from a moving discontinuity in said body, and

generating an electrical echo signal in response to said received echos, and

display means for converting said echo signal to a continuous visible image representing the moving cross-sectional structure of said heterogenous body.

the improvement whereby the quality of said image is substantially improved in comparison to rotating transducer and fixed-array transducer systems, said improvement comprising:

a. said transducer means consisting of a fixed segmented elongated array formed of N discrete adjacent transverse transducer elements, said elements being large in comparison to the wave length of said pulsed ultrasonic energy beam;

b. element counter-selector means for

1. transmitting identical cophased pulsed electrical signals to A selected adjacent transducer elements to generate identical cophased pulsed ultrasonic energy beams, and

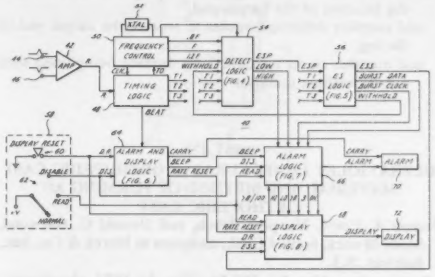
2. sequentially pulsing selected groups of A contiguous elements as in paragraph (b) (1), each of which groups are longitudinally displaced along said elongate array, each said group being displaced B elements from the location of the immediately preceding group;

N, A and B being positive integers and $N > A$, $N > B$.

3,881,467
HEART MONITORING SYSTEM

Albert Leven Stanly, and Robert Judd Hromadka, both of Los Angeles, Calif., assignors to Hycel, Inc., Houston, Tex.

Filed Nov. 9, 1973, Ser. No. 414,310
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **16 Claims**



1. A heart monitoring system comprising:

A. means for providing a beat signal indicative of the occurrence of each heartbeat, whereby a normal or an abnormal time interval exists between successive heartbeats;

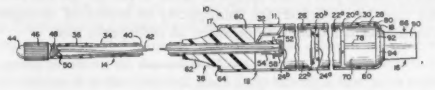
B. control means responsive to said beat signal for determining the interval between beat signals and for providing a first interval signal manifesting the time of said last occurring interval and for comparing said signal manifesting said last occurring interval with a stored signal manifesting the last occurring normal interval to determine whether the duration of said last occurring interval is at lease a certain percentage of the duration of said last occurring normal interval, said control means further providing a compared signal manifesting whether said last occurring interval is at least said certain percentage of said stored last occurring normal interval; and

C. storing means responsive to said compared signal for storing a signal manifesting the duration of the time interval of said last occurring interval as said last occurring normal interval only in the event said last occurring interval is at least said certain percentage.

3,881,468
FLEX LIGHT

Carl L. Foltz, Holiday, Fla., assignor to Concept, Inc., St. Petersburg, Fla.

Filed July 16, 1973, Ser. No. 379,218
Int. Cl. A61b *1/06*
U.S. Cl. 128—23 **6 Claims**

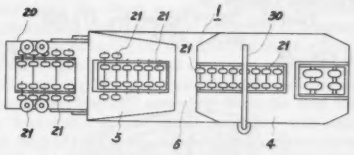


1. A surgical light comprising a housing configured to retain a voltage source therein, said housing having a first conductor means disposed therein, an extended bulb assembly and a switch means attached to said housing, said extended bulb assembly comprising an elongated sleeve having a second and third conductor means disposed therein, a bulb housing attached to one end of said elongated sleeve, a light source secured within said bulb housing by attachment means, mounting means attached to the opposite end of said sleeve to mount said extended bulb assembly to said first conductor to hold said third conductor means in operative engagement with said voltage source, said second and third conductor means being electrically insulated from each other, said first conductor means coupled to said second conductor means, said switch means rotatably mounted within said housing and electrically coupled to said voltage source, said switch means being out of contact with said first conductor means when in a first position to deactivate said surgical light; said switch means comprising a switch base means having a recess formed therein, contact means mounted within said recess and including a clip member configured to expose a plurality of first conductor contacts to movably engage said first conductor means and tongue means integrally attached to said clip member so as to complete the circuit between the voltage source, contact means and first conductor means.

3,881,469
MUSCLE RELAXING APPARATUS

Seizo Kanemitsu, 1,549, Takochi, Yaoshi, Osakafu, Japan

Filed Apr. 5, 1973, Ser. No. 348,232
Claims priority, application Japan, Apr. 8, 1972, 47-35513
Int. Cl. A61h *1/02*
U.S. Cl. 128—25 R **7 Claims**



1. A muscle relaxing apparatus comprising:

a. a relaxant surface comprising first and second movable portions spacedly separated from each other; and

b. first means cooperatively connecting said first and second portions and operative to cooperatively move both said first and second portions; and

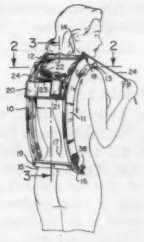
c. wherein said first means comprises support means operative to permit movement of said first and second portions in horizontal and vertical directions; and

d. wherein said support means comprises respective frames connected to said first and second portions, respectively, and to respective housings including universal means.

3,881,470
BACK MASSAGING APPARATUS

Avis O. Glore, 11524 National Blvd., W. Los Angeles, Calif. 90064

Filed July 8, 1974, Ser. No. 486,529
Int. Cl. A61h *23/00*
U.S. Cl. 128—55 **3 Claims**

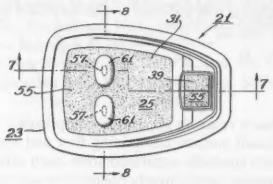


1. A back massaging apparatus comprising, in combination:

a. left and right shoulder frame members shaped to engage over a person's shoulders on either side of the neck at their upper ends, and extend down the back on either side of the spinal column to terminate at lower ends adjacent the person's lumbar;

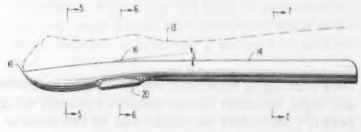
b. cross members connecting the frame members at points adjacent to their upper and lower ends to hold the spacing between the frame members substantially constant, each of said frame members defining track means;
c. a carriage mounted on the track means for movement along the frame members to various positions between the person's neck and lumbar regions;
d. a motor carried on said carriage;
e. first and second paddle means carried on said carriage;
f. actuating means operated by said motor engaging the paddle means to cause rapid alternate movement of the paddle means against the person's spinal column; and
g. means manually operable by the person for moving the carriage up and down along the frame members while the paddle means are being actuated to thereby massage said spinal column.

3,881,471
HYDROTHERAPY FOOT BATH
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Incorporated, Chicago, Ill.
Filed May 20, 1974, Ser. No. 471,455
Int. Cl. A61h *7/00*
U.S. Cl. 128—65 **8 Claims**



1. An improved hydrotheraphy foot bath for providing comforting and refreshing hydro-massage for feet and the like comprising:
a body including an upwardly open tub compartment and second separate, closed compartment, the tub compartment having a side wall and a relatively flat bottom wall and being adapted to hold a volume of water;
wall means for isolating the second compartment from the tub compartment so as to prevent ingress of water from the tub compartment into the closed compartment;
means detachably mounted on the bottom wall of the tub compartment for providing support for the arches of a person's foot disposed in the tub compartment; and
means for selectively imparting vibratory motion to the walls of the tub compartment so as to cause the continuous formation of multitudinous, relatively small waves in the water in the tub compartment whereby the water affords hydro-massaging action.

3,881,472
SPLINT FOR THE LEG OF A DOG OR CAT
George Timothy Lee, Anderson, Ind., assignor to Edgewood Surgical Company, Inc., Anderson, Ind.
Filed Feb. 22, 1974, Ser. No. 444,943
Int. Cl. A61f *5/04*
U.S. Cl. 128—89 R **2 Claims**



1. A splint for the lower front leg of a small animal such as a dog or a cat comprising:
a rigid elongate member having a forward and rear portion which is generally part cylindrical in cross-section for securing to the ventral portion of the animal's leg,
said forward portion of the member being adapted to receive the paw and carpal pad of a small animal and being inclined ventrally at an angle relative to the rear portion of the member and adapted to be positioned upwardly of the location of the carpal pad,
said member defining a recess to receive the carpal pad of the leg,
said member on its concave inner surface being lined with a soft, resilient material.

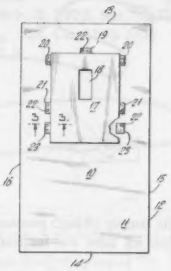
3,881,473
ULTRAVIOLET LIGHT CURABLE ORTHOPEDIC CAST MATERIAL AND METHOD OF FORMING AN ORTHOPEDIC CAST
Joseph A. Corvi, Newport Beach, and Donald C. Garwood, Santa Monica, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.
Continuation of Ser. No. 209,766, Dec. 20, 1971, abandoned.
This application Feb. 8, 1974, Ser. No. 440,936
Int. Cl. A61f *13/04*
U.S. Cl. 128—90 **24 Claims**

1. An orthopedic cast material which when wrapped about a body member and cured by exposure to ultraviolet light, forms a rigid, high strength immobilizing structure and which comprises a highly light and air permeable nonirritating open textile fabric of interknit or interwoven glass yarns and an ultraviolet light curable resin system carried by said yarns, said open textile fabric being of a mesh having essentially regularly spaced generally rectilinear openings with side dimensions between about 0.045 inches and 0.150 inches and wales or warp yarns separating adjacent openings to provide an average thickness to the open textile fabric of between about 0.035 inches and 0.060 inches in order to permit the ultraviolet rays to penetrate the multiplicity of layers of wrapped fabric that is required to produce an orthopedic cast.

3,881,474
REINFORCED SURGICAL DRAPE
Henrietta K. Krzewinski, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Continuation of Ser. No. 222,854, Feb. 2, 1972, abandoned.
This application Mar. 29, 1974, Ser. No. 456,348
Int. Cl. A61t *13/00*
U.S. Cl. 128—132 D **5 Claims**

1. A surgical drape comprising a main panel having an upper surface and a lower surface, a top edge and a bottom edge and two opposed side edges, a reinforcing panel having corresponding top, bottom and side edges, affixed to the upper surface of said main panel, at least one tab positioned at the top edge of the reinforcing panel and at least one tab positioned at a side edge of the reinforcing panel near the bottom edge of the reinforcing panel, each of said tabs having

a flexible portion free of the body of the drape, said flexible portion having at least two openings which extend through the



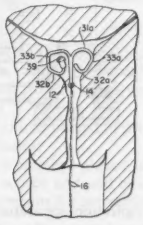
tab and through which a flexible member may be inserted and secured thereto.

3,881,475

INTRA-UTERINE CONTRACEPTIVE DEVICE

Harry W. Gordon, and Gunther Storz, both of Brooklyn, N.Y., assignors to Schmid Laboratories, Inc., New York, N.Y.

Filed Feb. 18, 1972, Ser. No. 227,465
Int. Cl. A61f 5/46
U.S. Cl. 128—130 **6 Claims**



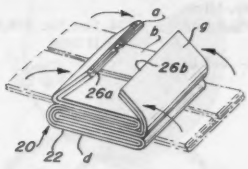
1. An intra-uterine contraceptive device comprising a substantially straight stem portion from which extends at one end thereof a pair of oppositely disposed loops which are generally coplanar with the stem, at least the loops of said device being of a soft plastic material and having a partially retentive memory to permit the loops of the device to deform and more readily conform to the walls of the uterine cavity into which the device is to be inserted, each loop having a first arch with a respective first radius and commencing in one direction from one end of the stem and curved to extend and terminate in a second direction opposite from said first direction; (a) an elongated straight section commencing at the termination of said first arch and extending for a distance in said second direction and generally parallel to the stem, and a second arch each of a (smaller) respective second radius (than) which is smaller than the radius of said first arch commencing at the termination of said elongated straight section extending in said second direction and then curving back to terminate with a free end extending toward said first direction; the cross-section of the loop material having a maximum dimension in one direction in the range of from about 0.055 to about 0.065 inches and a maximum dimension in a direction generally transverse to said one direction in the range of from about 0.045 to about 0.055 inches.

3,881,476

INTERLOCKED SURGICAL DRAPE AND METHOD

James H. Bolker, Hoffman Estates; Richard L. Zoephel, Lake Villa, and Robert F. Collins, Barrington, all of Ill., assignors to The Kendal Company, Walpole, Mass.

Filed May 3, 1973, Ser. No. 356,989
Int. Cl. A61f 13/00
U.S. Cl. 128—132 D **16 Claims**



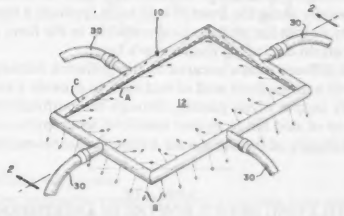
2. An interlocked surgical drape comprising, a sheet of flexible material including a pair of side edges extending longitudinally along the sheet, a pair of laterally extending end edges connecting said side edges, a plurality of longitudinally extending folds reducing the width of said sheet, a first lateral fold of the longitudinally folded sheet generally in the longitudinal mid-region of the sheet, said first fold defining a pair of contiguous end portions extending from the first fold and having free ends, and a lateral accordion fold extending through both of the contiguous end portions to interleave said end portions with ends of the end portions being exposed at an outer surface of the laterally folded sheet, whereby said sheet is interlocked to prevent premature unfolding of a substantial portion of the drape during manipulation of the drape and the sheet may be readily unfolded during placement by grasping the ends of the end portions.

3,881,477

FLUID DISCHARGE APPLIANCE FOR MAINTAINING A STERILE ENCLOSURE

Robert E. Von Otto, Washington, D.C., assignor to Henry E. Nichols, Washington, D.C.

Filed Aug. 7, 1973, Ser. No. 386,350
Int. Cl. A61f 13/00
U.S. Cl. 128—132 **8 Claims**



1. A surgical appliance for application to a living body to maintain a protective fluid shield for isolating an area of said body from the surrounding atmosphere, comprising: means defining a supporting surface for said body; a hollow tubular member of endless configuration in plan surrounding an access opening and supported at a level above said surface; means communicating with said member for delivering into said member a constant flow of fluid at super atmospheric pressure; said member being formed with a first series of substantially contiguous upwardly and inwardly directed fluid discharge ports, completely surrounding said access opening and discharging said fluid as a continuous, upwardly directed and convergent fluid shield over and completely around said access opening; said member being formed with a second series of substantially contiguous, downwardly directed dis-

charge ports for discharging said fluid as a continuous, downwardly directed fluid shield completely around said access opening.

3,881,478

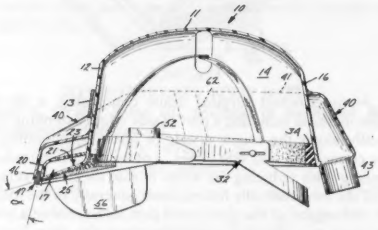
HARD HAT AIR CURTAIN

Thomas E. Rosendahl, McMurray, Pa., and William J. Krisko, Eden Prairie, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed June 13, 1974, Ser. No. 478,838

Int. Cl. A61f *9/06*

U.S. Cl. 128—145 R **10 Claims**



1. In an industrial helmet for protecting the wearer against inhalation of air-borne particulate matter, in combination:

an impact resistance shell carrying internal suspension means for mounting the helmet on the head of the wearer and comprising crown, front, side, and back portions and a chambered bill portion having a front wall, a perforated top, and a grillwork bottom extending from the rim of said front wall to the rim of said front portion to define the chamber of said bill;

an inwardly concave member surrounding said shell and sealed along a top edge to the walls of said shell and along a bottom edge to the front wall of said bill and the side and rear walls of said shell to define a manifold;

coupling means for receiving air supplied to said manifold;

an air curtain member forming a part of the seal between said manifold and the front wall of said bill, and comprising a strip of material having a plurality of parallel tubular passages extending therethrough and directed downwardly along the front of said bill to provide a high velocity output for air from said manifold in the form of an air curtain encircling the wearer's face;

and diffuser means secured to the grillwork bottom of said bill and the front wall of said shell to provide a low velocity output of air passing through the perforations in the top of said bill from said manifold, whereby to constitute a supply of inhallation air within said air curtain.

3,881,479

VENTILATING DEVICE FOR USE IN ANESTHESIOLOGY

Edward Carden, Cavendish House, Priestnall Rd., Stockport, England

Filed Mar. 13, 1974, Ser. No. 450,613

Claims priority, application United Kingdom, Mar. 10, 1973, 11692/73

Int. Cl. A61m *25/02*

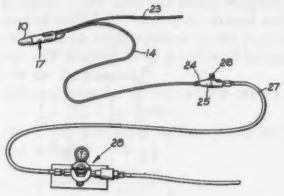
U.S. Cl. 128—145.8 **7 Claims**

1. A ventilating device connected to a supply of high pressure oxygen for use in anaesthesiology comprising:

a cannula having a lumen approximately 6.5 cm. in axial length,

an oxygen jet tube disposed within and connected to the cannula and terminating within the lumen thereof, the jet tube being directed toward an outlet end of the cannula, the oxygen jet tube being of a smaller diameter than the diameter of the lumen,

an inflatable cuff circumscribing the cannula with the axial length of the cannula being slightly in excess of the length



of the cuff, the supply of high pressure oxygen communicating with the jet tube for facilitating respiration in a patient.

3,881,480

BREATHING AID APPARATUS

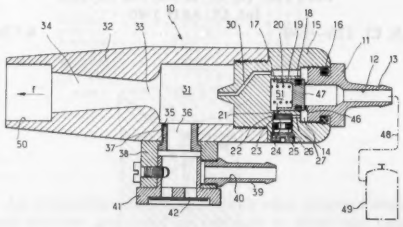
Jean-Michel Lafourcade, 7, rue Santos-Dumont, Paris, France

Filed Mar. 7, 1973, Ser. No. 338,979

Claims priority, application France, Mar. 10, 1972, 72.08488

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.8 **9 Claims**



1. An artificial respiration apparatus comprising:

a tip connectable to a source of gas under pressure, said tip including a bore hole;

a valve seat at the end of said bore hole facing away from the source;

an outlet connectable to the respiratory system of a patient; and

means for controlling the flow of gas permitting it to pass from the source of gas to said outlet during the inhalation phase of the patient but preventing said flow during the exhalation phase of the patient, said means comprising a movable valve member cooperating with said valve seat to close said bore hole, a spring cooperating with said movable valve member and biasing the same against said valve seat, a housing including a first chamber communicating with said source of gas and also with said outlet when the moving valve member is not in contact with the valve seat; and a second chamber in which said spring is housed, one wall of said second chamber being formed of said movable valve member, channel means causing said first chamber and said second chamber to communicate with each other, a pellet of porous material disposed in said channel means, said pellet introducing a loss of pressure in the channel means; and a pressure screw cooperating with said pellet for varying the compression thereof, variation of the compression of the pellet permitting adjustment of the flow of gas between said first and second chambers.

3,881,481

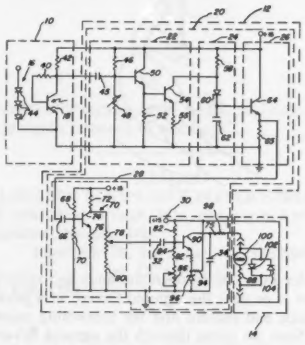
LEFT VENTRICULAR EJECTION METER

James E. Heule, Plymouth Village, and Richard C. Gaard, Golden Valley, both of Minn., assignors to Audronics, Inc., Minneapolis, Minn.

Filed Feb. 8, 1973, Ser. No. 330,746

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 V **6 Claims**



1. An apparatus for measuring and indicating the left ventricular output of the heart by monitoring light reflective characteristics of blood flow in blood vessels and capillaries, comprising:

a. a pulsating light source placed in proximity to said blood vessels and capillaries;

b. a light responsive element placed in reflective relationship to said light source and said blood vessels and capillaries, and having means for converting received light into electrical signals;

c. circuit means, connected to said light responsive element, for receiving said electrical signals and attenuating frequency components of said signals below about 0.6 Hz. and above about 40 Hz.; and

d. indicator means, connected to said circuit means, for providing an observable indication of said nonattenuated electrical signals.

3,881,482

DEVICE FOR MOISTENING AND HEATING INHALATION AIR WITH TRACHEOTOMY AND ENDOTRACHEAL INTUBATION

Carl-Eric Lindholm, Uppsala, Sweden, assignor to Medical Products Octagon AB, Uppsala, Sweden

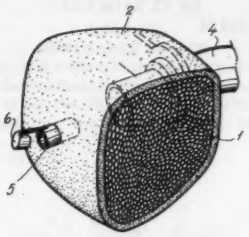
Filed Oct. 25, 1973, Ser. No. 409,571

Claims priority, application Sweden, Nov. 6, 1972, 14331/72

Int. Cl. A61m *15/00*

U.S. Cl. 128—212 **7 Claims**

1. A device for moistening and warming inhalation air with tracheotomy and endotracheal intubation, said device having a cavernous body which is made of a light, porous material having an open pore structure and which is encased in a cylinder-like casing of light material having open ends and having a porosity which is denser than that of the body, said cavernous body completely filling said cylinder, a recess extending through the casing into the body intended to function as a



passage-way through said casing for air passing between said cavernous body and a patient through a tracheal tube.

3,881,483

EXTRACORPOREAL BLOOD CIRCUIT

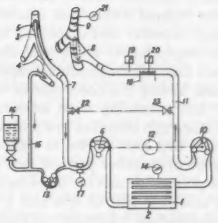
Andre Sausse, Sceaux, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed Sept. 12, 1973, Ser. No. 396,603

Claims priority, application France, Sept. 12, 1972, 72.32286

Int. Cl. A61m *01/03*

U.S. Cl. 128—214 R **20 Claims**



1. An extracorporeal blood circuit comprising, in combination:

a. a blood oxygenator;

b. a first peristaltic pump including a variable tube means of a type having a capacity variable between maximum and minimum values in proportion to the pump inlet pressure, the maximum capacity being reached at an inlet pressure of atmospheric pressure ± 20 mm of mercury;

c. an inlet of said first pump connectable to a patient's blood circuit;

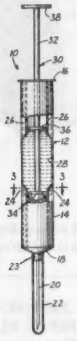
d. an outlet of said pump connected in series with said oxygenator;

e. a second peristaltic pump including a variable tube means of a type having a capacity variable between maximum and minimum values in proportion to the pump inlet pressure, the minimum capacity being reached at an inlet pressure of atmospheric pressure ± 20 mm of mercury;

f. an inlet of said second pump connected in series with said blood oxygenator; and

g. an outlet of said second pump connectable to said patient's blood circuit.

3,881,484
MIXING SYRINGE HAVING A ROTATIONALLY RESTRAINED PISTON ROD
Charles F. Gidcumb, Jr., 207 E. Maywood, Morton, Ill. 61550
Filed July 5, 1973, Ser. No. 376,427
Int. Cl. A61m 5/22
U.S. Cl. 128—218 M 4 Claims



1. A syringe device for separately storing and facilitating mixing of two substances preparatory to discharge from the syringe, comprising, in combination, body means defining a longitudinally extending chamber having an open end and a discharge end, plunger means disposed within said chamber and longitudinally movable therein, said body means having a first pair of ribs formed within said chamber and extending from within said chamber and extending from adjacent said discharge end longitudinally along said chamber a distance substantially less than the longitudinal length of said chamber, said body means having a second pair of ribs formed within said chamber and extending from adjacent said open end longitudinally along said chamber to a position spaced longitudinally from said first pair of ribs to define an intermediate generally cylindrical chamber portion, first piston means supported by said plunger means for movement between a position engaging said first pair of ribs and a position disposed within said intermediate chamber portion, said first piston means having a peripheral surface configuration conforming to the cross-sectional configuration of said chamber taken through said first pair of ribs so as to provide a sealing relation with the peripheral surface of said chamber when said first piston means is engaging said first pair of ribs, said first piston means when in engagement with said first pair of ribs defining with said discharge end a first compartment to receive one of said two substances, second piston means carried by said plunger means in longitudinally spaced relation from said first piston means and having a peripheral surface configuration conforming to the cross-sectional configuration of said chamber taken through said second pair of ribs so as to engage said second pair of ribs and the adjacent peripheral surface of said chamber in sealing relation therewith, said second piston means cooperating with said first piston means to define a second compartment therebetween adapted to receive the other of said two substances, said second piston means and said second pair of ribs cooperating to prevent rotation of said plunger means about its longitudinal axis while allowing movement of said plunger means to a position wherein said first piston means is spaced longitudinally from said first pair of ribs to allow intermixing of said substances, said plunger means being thereafter movable to effect discharge of the mixed substances from said discharge end of said body means.

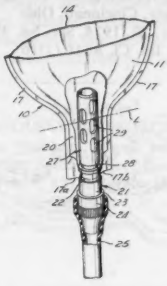
3,881,485
RECTAL APPLIANCE
Hal M. Davis, Jr., Apt. No. 706, 4045 Linkwood, Houston, Tex. 77025
Filed July 16, 1973, Ser. No. 379,602
Int. Cl. A61f 13/20
U.S. Cl. 128—270 2 Claims

1. Device for insertion through the anus and rectum to a fitted position at or near the sigmoid flexure of a person for wiping the anus and rectum and for preventing passage of fecal matter from the colon through the sigmoid flexure into the rectum, comprising a wiper plug element of non-irritating reaction and of yieldable material which does not swell excessively when wetted, said plug element having a smoothly convexly rounded forward end and cylindrical sides and having a concave depression in its rearward end of a size to receive the end of a finger during insertion of said plug element through the anus and rectum said device including sleeve means of flexible film material having said wiper plug element disposed therewithin, an end of said sleeve means being closed and said wiper plug element being disposed adjacent thereto, said sleeve means having a first temporary seal adjacent said wiper plug element at the opposite side of said wiper plug element from said closed sleeve end and having a second temporary seal spaced therefrom, and a supply of lubricant within said sleeve means between said first and second temporary seals, whereby said first temporary seal may be broken to expose said wiper plug element to said lubricant and whereby said second temporary seal may be broken to expel said lubricated wiper plug element from said sleeve for introduction through the anus of the user, said sleeve being invertable to form a lubricated cover for a member used to force said wiper plug element through the anus and rectum to a position at or near the sigmoid flexure of the user.

3,881,486
DRAINAGE POUCH
Leonard Fenton, Beachwood, Ohio, assignor to Marlen Manufacturing and Development Co., Bedford, Ohio
Filed Mar. 13, 1973, Ser. No. 340,818
Int. Cl. A61f 5/44
U.S. Cl. 128—283 8 Claims

1. A drainage pouch comprising a bag having relatively flat sidewalls, a first opening in one of said sidewalls adjacent one end adapted to be applied to and surround the stoma of a bedridden patient, the other end of said bag having a narrowed, hollow neck portion which defines a second opening at its distal end, and tube means projecting from said second opening within and through said neck portion and terminating beyond said neck portion in a main chamber defined by said

bag, said tube having at least one aperture in communication with the main chamber for freely passing drainage from said



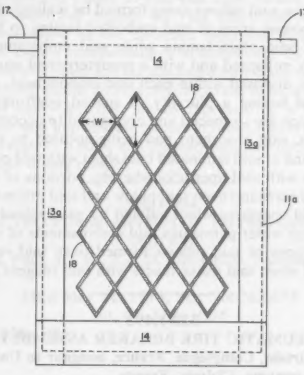
main chamber through said tube means, said tube means being relatively rigid compared to said bag.

3,881,487

FLUSHABLE DISPOSABLE DIAPER STRUCTURE

Mark S. Schrading, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed July 30, 1973, Ser. No. 383,898
Int. Cl. A61f *5/44*
U.S. Cl. 128—284 **4 Claims**



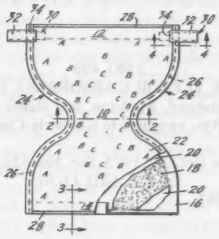
1. In a disposable diaper comprising a substantially rectangular absorbent pad of intermingled wood pulp fibers, a fluid-pervious cover sheet, a fluid-impervious backing sheet of thin plastic film and narrow plastic film baffle members extending transversely across the diaper at each end thereof; in which the longitudinal edge portions of said backing sheet are folded around the respective pad edges to extend over the top of the pad for a short distance and are attached to said cover sheet along the entire length thereof; in which each of the ends of said backing sheet and said cover sheet extend beyond each of the ends of said pad and have said baffle member interposed therebetween; in which the cover sheet, backing sheet and baffle are bonded to each other on a line adjacent the pad ends; and in which the free edge of said baffle member opposite from the bonded portion is interposed between said pad and said cover sheet; the additional structure wherein said pad is adhered to said backing sheet by interconnected lines of adhesive disposed in a selected lattice-like open pattern in only that area of said pad which does not underlie said baffle members or said folded-over portion of said backing sheet, said adhesive being applied in sufficient quantity to penetrate said pad for a short depth, the open area encompassed within the individual segments defined by the unbonded spaces between the lines of said pattern being between about 2 square inches and 3 square inches in area.

3,881,488

DISPOSABLE DIAPER

John T. Delanty, and William E. Hanson, both of Neenah, Wis., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 194,307, Nov. 1, 1971, abandoned.
This application Aug. 9, 1973, Ser. No. 387,155
Int. Cl. A41b *13/02*
U.S. Cl. 128—287 **8 Claims**



1. A disposable diaper of substantially hourglass outline having an intermediate portion of less width than the two end portions, comprising a moisture-impermeable outer backing sheet, an integral fluid absorbant pad of unbonded cellulose fiber fluff disposed on said backing sheet and a fluid-permeable, high wet strength inner liner sheet of non-woven material disposed on said absorbant pad, said backing and liner sheets extending beyond the side edges of said pad and having their inside faces in superimposed face-to-face adhered relationship in the area of such extension, the end portions of said backing sheet extending around and covering the end edges of said absorbant pad and being back-folded and lap-sealed to said inner liner sheet, said absorbant pad being formed of a single, integral layer of varying thickness and smoothly contoured for even transition from relatively thin sections near the diaper side and end edges to a relatively thick section, said relatively thick section being generally eliptical in plan view with the major axis of said elipse disposed longitudinally of said diaper and the minor axis of said elipse disposed transversely of said diaper and generally aligned with the minimum width portion of said diaper, said eliptically shaped relatively thick section constituting a central area of between approximately 15 to 30 percent of the total absorbative pad area.

3,881,489

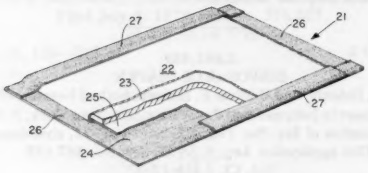
BREATHABLE, LIQUID INPERVIOUS BACKSHEET FOR ABSORPTIVE DEVICES

Edward Wallace Hartwell, Lawrenceburg, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 20, 1973, Ser. No. 389,841
Int. Cl. A41b *13/02*
U.S. Cl. 128—287 **20 Claims**

1. In a disposable absorbtive device having an absorbent body and a backsheet, an improved breathable, liquid impervious backsheet, comprising: the combination of two adjacent hydrophobic layers to form an effective breathing portion of the improved backsheet; the first layer being liquid permeable under pressure and having a low void volume; the second layer

being liquid permeable and having a high void volume, whereby the combination of the two layers prevents the passage of liquid while permitting the passage of vapors and gasses.

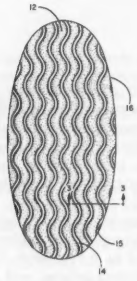


3,881,490

THIN, FLEXIBLE ABSORBENT PADS

Howard A. Whitehead, Appleton, and Ralph V. Braun, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 20, 1973, Ser. No. 426,521
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **9 Claims**



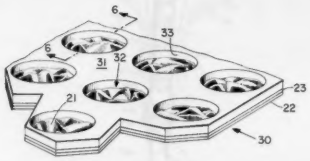
1. An elongate thin absorbent pad with soft flexible edges, said pad comprising a fluid pervious cover sheet of non-woven fibers, a central absorbent batt of comminuted wood pulp fibers, and a fluid impervious backing element; said cover sheet, absorbent batt, and backing element being coextensive; the entire undersurface of said cover sheet being secured to said batt by a light overall layer of flexible adhesive which does not penetrate into the batt; said cover sheet and said batt having a spaced pattern of line embossments impressed therein; said line embossments extending primarily in the longitudinal direction of said pad and intersecting the edges and ends of said pad at spaced intervals; said line embossments defining areas of said batt in which the fibers have been moisture conditioned and sufficiently compacted in the *z* direction to form hydrogen bonds between those fibers disposed in said line embossment areas; said backing element being secured to the bottom of said batt by discrete adhesive segments disposed in a spaced pattern; the adhesive between said cover sheet and said backing element respectively serving to attach only the respective surface fibers of the batt to said cover sheet and backing element in the adhesive areas; the integrity of said batt in the *z* direction between cover sheet and backing sheet being provided solely by said hydrogen bonding; and the fibers in the ends and edges of said batt being free of *z*-direction bonding except where intersected by said line embossments.

3,881,491

SELF-INFLATING STRUCTURE

David Denzil Whyte, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 29, 1974, Ser. No. 456,510
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **4 Claims**



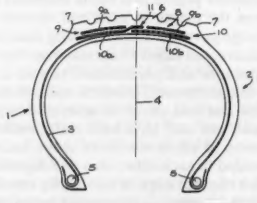
1. A disposable diaper comprising a self-inflating pillow structured laminated backsheet, an absorbent pad, a wicking sheet of hydrophilic material, and a topsheet of porous hydrophobic material, said absorbent pad being disposed intermediate said backsheet and said wicking sheet, and said wicking sheet being disposed intermediate said absorbent pad and said top sheet, said laminated backsheet comprising a plain lamina of substantially water impermeable thermoplastic film, an embossed lamina of semipermeable thermoplastic film which is substantially water permeable, and a predetermined amount of water-reactive gas-evolving reagent, said embossed lamina having a plurality of pillow forming embossments formed therein which are spaced by unembossed areas of said embossed lamina, said pillows being formed by sealingly securing said unembossed areas of said embossed lamina to adjacent portions of said plain lamina while said embossments are substantially collapsed and with a predetermined quantity of said reagent disposed within each said embossment, said absorbent pad having a plurality of spaced apertures therethrough which are so spaced and configured to accommodate said pillows, said absorbent pad being secured to said embossed lamina of said laminated backsheet with said pillows in registration with said apertures whereby portions of said absorbent pad surround each said pillow and said pillows extend through said apertures when inflated by gas evolved by said reagent when water permeates said embossments of said embossed portions of said pillows formed from said embossed lamina and when said water reacts with said reagent.

3,881,492

PNEUMATIC TIRE BREAKER ASSEMBLY

Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, a Societe Anonyme, Clairoix, France

Filed Apr. 19, 1974, Ser. No. 462,262
Claims priority, application France, July 3, 1973, 73.24443
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 R **17 Claims**



1. A pneumatic tire comprising a carcass having a crown region, a tread overlying said crown region, and a reinforcing breaker interposed between said tread and carcass, said breaker comprising a first pair of plies lying substantially in a common circumferential plane, said plies having respective

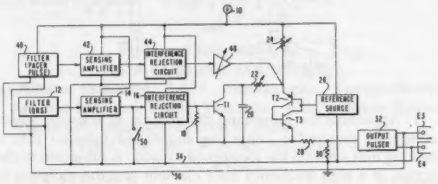
marginal edge portions one of which overlaps the other and defines a second circumferential plane surrounding the first said circumferential plane, and a second pair of plies overlying said first pair of plies, extending in said second circumferential plane and axially spaced from one another by said overlapping marginal edge portions of said first pair of plies.

3,881,493

SYNCHRONOUSLY REINFORCING PACER

Robert L. Cannon, Waltham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 7, 1974, Ser. No. 440,612
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 PG **10 Claims**



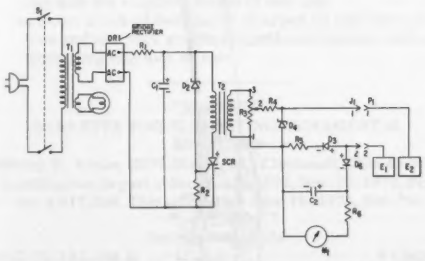
6. An external heart pacer for supplementing the operation of the implantable heart pacer of a patient comprising means for generating pulses, electrode means for coupling to a patient's heart, timing means for controlling the cyclic application of generated pulses to said electrode means, means for detecting electrical signals on said electrode means, and means responsive to the detected electrical signal on said electrode means representing a heartbeat for inhibiting the generation of a pulse and for starting a new cycle of operation of said timing means and responsive to the detected electrical signal on said electrode means representing a stimulating pulse from said implantable pacer for immediately controlling the generation of a pulse and for starting a new cycle of operation of said timing means.

3,881,494

ELECTRO PULSE ARTHRITIC PHYSIOTHERAPY SYSTEM

James M. Paul, Jr., Rt. 3, P.O. Box 400-B, Panama City, Fla. 32401

Filed May 22, 1973, Ser. No. 362,678
Int. Cl. A61n *1/36*
U.S. Cl. 128—421 **8 Claims**



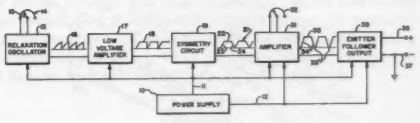
1. An electro-pulse arthritic physiotherapy system for providing an output electronic stimulative impulse to a mammalian subject comprising an alternating current source; a switch means connected to said source; a first transformer having a primary and a secondary; said switch and primary being connected in series with said source; a bridge rectifier; said rectifier being connected to said secondary of said first transformer; said rectifier having first and second outputs; a first resistance; a second transformer having a primary and secondary; said first resistance being connected to said first output; a circuit including a first capacitor connected between said first resistance and the second output; a first Zener diode; a second resistance; said Zener diode and said second resistance being connected in a series circuit between said first resistance and second output of said bridge rectifier; a silicon controlled rectifier having a gate lead; the primary of said second transformer and said silicon controlled rectifier being connected in a circuit in series between said first resistance and second output; and said first capacitance circuit, said Zener diode circuit and said second transfomer primary circuit all being arranged in parallel; said gate lead of the silicon controlled rectifier being connected in to said Zener diode circuit between the Zener diode and second resistance; first and second pins forming output connections for the secondary of said second transformer; a variable resistance connected between said first and second pins in parallel with said secondary of said second transformer; a first electrode for attachment to a mammalian subject; a third resistance; means to connect said third resistance in series with said electrode and a portion of said variable resistance; a second electrode for attachment to a mammalian subject; a first diode; a fourth resistance; a second Zener diode; said second electrode, said first diode and said fourth resistance being connected in series with said second pin; said second Zener diode being connected between said third and fourth resistance elements, and also in parallel with the secondary of said second transformer; a second capacitor connected in parallel with said first diode and said fourth resistance; a second diode connected between said first diode and said second capacitor; a voltmeter connected in parallel with said second capacitor; and a fifth resistance connected between said second capacitor and said voltmeter.

3,881,495

METHOD OF NERVE THERAPY USING TRAPEZOIDAL PULSES

Anthony N. Pannozzo, 3755 Barber Dr., Youngstown, Ohio 44406, and Anthony M. Jannetto, 245 Sleepy Hollow Dr., Canfield, Ohio 44406

Filed Aug. 8, 1973, Ser. No. 386,514
Int. Cl. A61n *1/36*
U.S. Cl. 128—422 **9 Claims**



1. A method of treating nerves of a patient by electrical stimulation which includes the steps of:

positioning electrodes at spaced locations on the body of the patient such that current flowing between said electrodes will pass through a nerve;

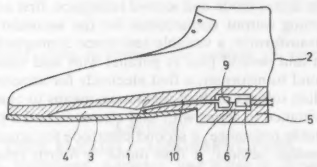
generating electrical pulses each having a trapezoidal wave shape defined by a top portion of essentially greatest electrical potential and sloping sides diverging from said top portion as the electrical potential falls to zero and below to form a negative pip that comes to a point, and applying said electrical pulses across said electrodes.

3,881,496

APPARATUS AND METHOD FOR ELECTRICALLY STIMULATING LEG MUSCLES

Jakob Vredenbregt; Willem Hadde Noordermeer, and Jacobus Martinus Westoff, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 783,004, Dec. 11, 1968, abandoned.
This application Feb. 16, 1971, Ser. No. 115,786
Int. Cl. A61n
U.S. Cl. 128—423 11 Claims



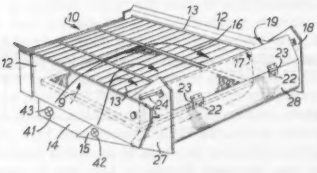
8. A therapeutic apparatus for electrically stimulating the nerve tissues controlling the muscles in a leg having inadequate neurological control in order to obtain a normal walking pattern comprising, means for generating activation current pulses, an air-filled chamber having a flexible wall and adapted to be located beneath the ball of the foot of the sound leg, pneumatic coupling means coupling the air chamber to the pulse generating means for periodically actuating said pulse generating means in response to the change in pressure in the air chamber produced by the displacement of the body weight on the ball of the sound foot during walking, a pair of electrodes adapted to be placed over said nerve tissues on the defective leg, and means connecting said electrodes to the output of said pulse generating means.

3,881,497

GRAIN HARVESTER EQUIPMENT

David John Farrant, Welshes Farm, Clatworthy, Wiveliscombe, Somerset, England

Filed Dec. 22, 1972, Ser. No. 317,818
Claims priority, application United Kingdom, Dec. 23, 1971, 60052/71; Apr. 25, 1972, 19098/72
Int. Cl. A01f *12/52*
U.S. Cl. 130—24 6 Claims



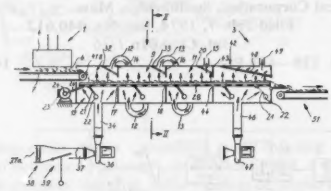
1. Grain harvesting equipment comprising a collector screen for separating grain from chaff, an outlet duct adapted to receive the grain passing through the screen, a return duct having an unobstructed mouth positioned to collect grain and chaff which passes over a downstream end of the screen, the return duct being positioned to communicate with the outlet duct for the return to the outlet duct of the grain so collected, a blower located upstream of the outlet duct for providing an upward and downstream current of air through the outlet duct and the screen and beyond the mouth of the return duct, means defining a restricted opening between the ducts for preventing a current of air from the blower which passes into the outlet duct from opposing movement of the grain from the return duct into the outlet duct.

3,881,498

APPARATUS FOR INCREASING THE VOLUME OF MOIST TOBACCO

Waldemar Wochnowski, Hamburg, Germany, assignor to Hauni-Werke Korber & Co. AG, Hamburg, Germany

Filed Jan. 26, 1972, Ser. No. 220,848
Claims priority, application Germany, Jan. 27, 1971, 2103669
Int. Cl. A24b *3/18, 9/00*
U.S. Cl. 131—134 10 Claims



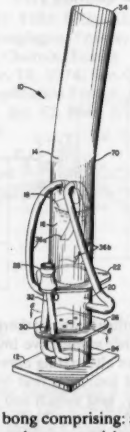
1. Apparatus for increasing the volume of tobacco which comprises means for conveying moistened tobacco thru a heating unit wherein the moistened tobacco is subjected to the action of a high frequency field element and the moisture in the tobacco capillaries is vaporized with attendant expansion of the tobacco, means for conveying the expanded tobacco through a drying unit wherein the tobacco is subjected to a short-lasting external heating action sufficient to effect rapid drying of the tobacco adjacent the external surfaces of the tobacco and means for conveying the thus heated tobacco to a cooling unit said unit being provided with means to produce a forcible cooling action on the tobacco sufficient to effect condensation of the vaporized moisture already present in the capillaries of the tobacco without significantly affecting the surface thereof.

3,881,499

WATER PIPE OR BONG

Michael Duncan McFadden, 10601 River Rd., Potomac, Md. 20854, and Peter Robin Barnhard, 7539 Spring Lake Dr., Bethesda, Md. 20034

Filed Sept. 11, 1973, Ser. No. 396,138
Int. Cl. A24f *01/30*
U.S. Cl. 131—173 27 Claims



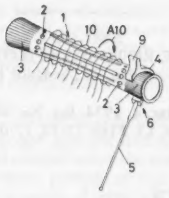
1. A water pipe or bong comprising: an inhalation and water chamber; a base chamber comprising ash and solid matter contaminant trap means and including top, divider plate means for separating said base chamber from said inhalation

and water chamber, a bottom wall and sidewall means connecting said divider plate means and said bottom wall to complete said chamber; an inhalation and water chamber mounted on said base chamber; a bowl for burning a substance to be smoked; primary fluid communication means for directing combustion products including smoke from said bowl to said trap through said sidewall means; and secondary fluid communication means for directing smoke substantially free of ash and solid matter contaminants from said trap to said inhalation and water chamber; said primary and secondary fluid communication means being in indirect registry with each other in said trap; whereby during use of the bong, said trap, substantially by virtue of gravity forces, collects such solid matter passing from said bowl through said primary fluid communication means thereby substantially preventing matter other than smoke from passing to water in said inhalation and water chamber.

3,881,500
HAIR CURLING EQUIPMENT

Toshiharu Shinbashi, 3-655, Maekawacho, Kawaguchi-shi, Saitama-ken, and Yuichi Yasumoto, 823-3, Ohaza Ryoke, Urawa-shi, Saitama-ken, both of Japan

Filed Nov. 26, 1973, Ser. No. 418,872
Int. Cl. A45d *2/12*
U.S. Cl. 132—33 B **9 Claims**



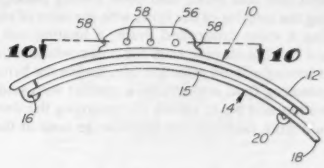
1. A hair curling device comprising:
a stick having a straight pin portion;
a cylindrical rod having an outer portion on each end thereof and an inner portion therebetween, attaching means being provided on at least one of said outer portions for cooperating with said stick to hold said stick non-rotatably with respect to said rod with said pin portion projecting in a direction substantially perpendicular to the longitudinal axis of said cylindrical rod;
said stick having cooperating means thereon for cooperating with the attaching means of said rod;
such that a lock of hair can be wrapped on said inner portion and said stick attached to said outer portion without contacting said lock of hair.

3,881,501
BARRETTE FOR SUPPORTING ORNAMENTAL BROACHES

Shirley H. Kleine, 8877 Weller Rd., Cincinnati, Ohio 45242

Continuation-in-part of Ser. No. 305,592, Nov. 10, 1972, Pat. No. 3,817,260. This application June 10, 1974, Ser. No. 477,666
Int. Cl. A45d *8/24*
U.S. Cl. 132—48 R **9 Claims**

1. A barrette for securing therein an ornamental broach, said broach being of the type having an ornamental element with a fastening element on one side thereof, said fastening element including an elongated pin having one end pivotally secured to the fastening element, the opposite end of said pin being adapted to be removably secured to said ornamental element; said barrette comprising a body portion, hair tress clasping means carried by the body portion for securing the barrette to a hair tress, a cradle carried by said body portion and having at least one bore extending longitudinally therethrough, said cradle being adapted to receive the pin of said

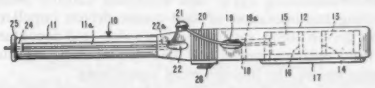


broach through a bore thereof in a plurality of different angular positions relative to said body portion.

3,881,502
DENTAL FLOSS DISPENSER

William E. Bennington, 5 Fillmore Dr., St. Armands, Sarasota, Fla. 33578

Continuation-in-part of Ser. Nos. 215,532, Jan. 5, 1972, Pat. No. 3,833,009, and Ser. No. 54,253, July 13, 1970, abandoned. This application June 25, 1974, Ser. No. 483,025
Int. Cl. A61c *15/00*
U.S. Cl. 132—91 **1 Claim**



1. A dental floss dispenser comprising a finger section communicating with a spool section, a freely turnable spool of dental floss in said spool section and retaining cap means for retaining said spool in said spool section, a bore hole extending through said finger section and comprising a longitudinal slot along the top thereof communicating with said bore hole, said spool section comprising a side open slot extending from within the spool section to a first hole means in the top of said dispenser, a second hole means in the top of said dispenser communicating with said bore hole, braking means disposed between said first and second hole means comprising top serrated frictional means for manually holding said floss taut during use and pin means on the side of said dispenser around which said floss passes and is also frictionally held during use, whereby said floss is threaded from said spool section through said side slot means, out of said first hole means, over and around said serrated means and pin means, into said second hole means, through said bore means and out the end of said finger means, and whereby said braking means are manually operable during use of said dispenser for frictionally holding said dental floss taut, and when manually released will permit said floss to be freely pulled through said dispenser.

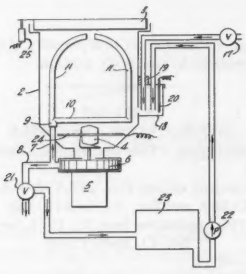
3,881,503
APPARATUS FOR WASHING AND DECONTAMINATING ARTICLES

John Francis Fox, Edinburgh, Scotland, and Bernard Frank Harber, Poole, England, assignors to Ethicon, Inc., Somerville, N.J.

Filed July 12, 1973, Ser. No. 378,748
Claims priority, application United Kingdom, July 12, 1972, 32609/72
Int. Cl. B08b *11/02*
U.S. Cl. 134—57 R **5 Claims**

1. In an apparatus for washing and decontaminating articles including a bowl having a motor driven impeller located therein and a top cover for sealing said bowl, a motor driven pump for supplying pressurized fluid to a support means having pipes connected thereto located within said bowl, each of said pipes having at least one outlet orifice and being adapted

to have some articles connected thereto in a manner such that in use fluid from said pipes passes through the interior of the articles and into said bowl, said bowl having passage means connecting the interior of the bowl with the inlet of said pump and having a valve controlled drain, a heating coil located within said bowl, a storage tank for a decontaminating fluid, said fluid having a fixed effective life, means for bringing the decontaminating fluid into effective contact with said articles located within said bowl, means for returning the decontaminating fluid from said bowl to said storage tank at the end of



a decontaminating cycle, and electrical control means for affecting the operation of said motor driven impeller, said motor driven pump, said bowl drain valve, said decontaminating fluid bringing means and said decontaminating fluid returning means; the improvement comprising:

means associated with said bowl for promoting self-draining of bowl surfaces when a fluid is drained from the bowl; and

means associated with said electrical control means for regulating the operational life of said decontaminating fluid.

3,881,504

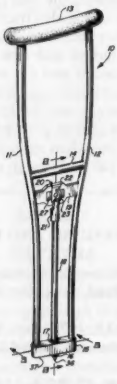
CONVERTIBLE CRUTCH

Carl F. Pfaff, P.O. Box 155, Cave Creek, Ariz. 85331

Filed June 3, 1974, Ser. No. 475,629

Int. Cl. A61h *3/02;* **A45b** *9/04*

U.S. Cl. 135—53 **1 Claim**



1. A crutch convertible for use on dry or slippery surfaces comprising:

a pair of spacedly arranged elongated support members interconnected at one end by a cross member for fitting under the arm pits of a user,

a handgrip arranged to extend laterally between said support members at a point between their ends,

a tread member formed of resilient material for gripping a smooth surface interconnecting said support members at their other ground engaging ends,

said tread member having an aperture extending therethrough longitudinally of said crutch,

a rod arranged between and within the plane of said support members longitudinally of said crutch with one end movable in said aperture of said tread member,

a spike removably attached to said one end of said rod for aiding in gripping a slippery surface,

the other end of said rod extending adjacent to said handgrip,

means mounted adjacent said handgrip and attached to said other end of said rod for moving said rod within said aperture of said tread member to protrude said one end of said rod beyond said tread member or retract it within said aperture,

said means comprising a locking means for holding said rod in its retracted and extended positions,

said locking means comprises a supporting plate having a slotted cross like configuration with one arm of the slot extending longitudinally of the crutch and the other arm laterally thereof,

a flat plate pivotally mounted at said one end of said rod for fitting into either arm of said slotted configuration, and

means for moving said plate into either arm of said slotted like configuration to lock said rod in either the retracted or protruding position.

3,881,505

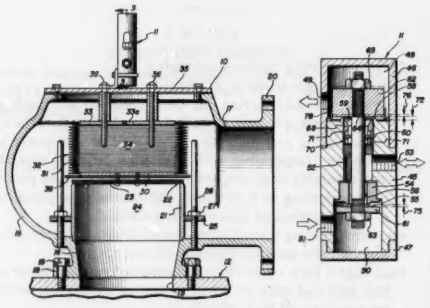
PRESSURE RESPONSIVE PILOT VALVE

Evald Dunkelis, Glen Ellyn, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Mar. 4, 1974, Ser. No. 447,962

Int. Cl. F16k *17/10, 11/02*

U.S. Cl. 137—375 **21 Claims**

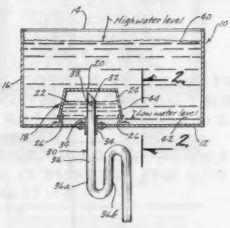


1. In combination with a differential pressure main relief valve mounted on a tank including a relief seat having a relief port communicating on one side with the tank and on the other side with atmosphere, a relief pallet coacting with the seat to selectively open and close the relief port to atmosphere, means defining a differential pressure chamber for controlling movement of said relief pallet, a pilot valve connected between the tank and the differential pressure chamber having first means for selectively connecting the chamber to atmosphere when the tank pressure reaches a set point pressure above atmospheric thereby permitting the tank pressure to unseat the relief pallet and connect the relief port to atmosphere to vent the tank, and second means selectively connecting the chamber to tank thereby maintaining the relief pallet seated to close the relief port or closing the tank connection thereto when said first means connects the chamber to atmosphere thereby preventing the venting of the tank through the pilot valve when the relief port of the main valve is open.

3,881,506
DOSING SYPHON

Thamon E. Hazen, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed July 26, 1973, Ser. No. 382,652
Int. Cl. F07f *10/02*
U.S. Cl. 137—137 **3 Claims**



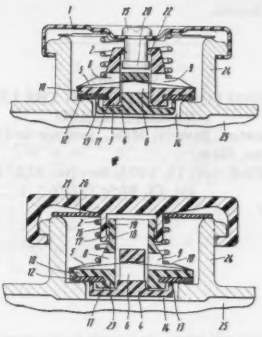
1. In a dosing syphon, comprising,
a water reservoir comprised of a housing having bottom and top portion,
a bell compartment means in said housing and spaced from said bottom portion, said bell compartment means having a closed upper portion and a lower portion in communication with the interior of said housisng for receiving water from the interior of said housing,
a substantially vertical conduit extending from an upper open end within said bell compartment means downwardly and outwardly through said housing,
a trap element in said conduit to capture a quantity of water therein at times,
a water charging opening in communication with the interior of said conduit adjacent said opening in the upper portion of said conduit below the upper end thereof and above the bottom portion of said bell compartment means so that a supply of water will be available to said trap element while the water level rises within said bell compartment means but before water flows into the upper end of said compartment, wherein a constant supply of water will be available in said trap element,
said vertical conduit having a beveled open upper end whereby the natural rotational movement of water as it enters said conduit is substantially eliminated,
said open upper end being continuously sloped.

3,881,507
CAP FOR LIQUID CONTAINER

Eugen Stump, Stuttgart, Germany, assignor to Suddeutsche Kuklerfabrik, Stuttgart, Germany

Filed Feb. 13, 1974, Ser. No. 442,093
Claims priority, application Germany, Feb. 22, 1973, 2308669
Int. Cl. F16k *15/16*
U.S. Cl. 137—493.4 **10 Claims**

1. A cap with automatically operating excesspressure and vacuum valves for a liquid container having a cylindrical opening neck and a shoulder extending within said neck below the top thereof, comprising
a sealing lid having means for engaging the neck of the liquid container;
a central part displaceably connected to said lid and positioned on the underside thereof and said central part having radial slots therethrough;
a compression spring urging said central part away from said sealing lid toward contact with the shoulder of the liquid container;
a vacuum valve part displaceably mounted within said central part and having a flanged portion therebelow and said vacuum valve part having a lateral hole therethrough in the area of said radial slots, and
spring means comprising a leaf spring passing through said radial slots and said lateral hole for urging the flanged portion of said vacuum valve part toward said central part;

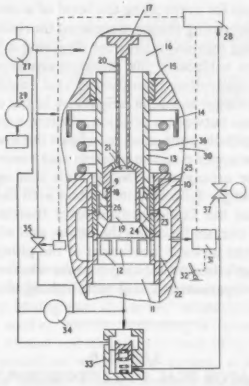


whereby an excess pressure will urge said central part away from sealing engagement with the shoulder and a vacuum will urge said vacuum valve part away from sealing engagement with said central part.

3,881,508
THROTTLE VALVE ARRANGEMENT

Trevor Stanley Smith, Birmingham, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Oct. 3, 1973, Ser. No. 403,006
Claims priority, application United Kingdom, Oct. 3, 1972, 45458/72
Int. Cl. F16k *31/12*
U.S. Cl. 137—501 **2 Claims**



1. A throttle valve arrangement for use in a gas turbine engine, comprising an inlet, an outlet, a fixed orifice and a variable orifice in series between said inlet and outlet, said variable orifice being on a side of said fixed orifice remote from said inlet and said variable orifice having a piston control member, a spring biasing said control member in a direction to open said variable orifice, said control member comprising a sleeve having first, second and third areas respectively responsive to the pressures on the inlet side of said fixed orifice, on the side of said fixed orifice remote from said inlet side and on the outlet side of said variable orifice, an increase in the pressure on said first and third areas urging the control member towards its closed position and an increase in the pressure

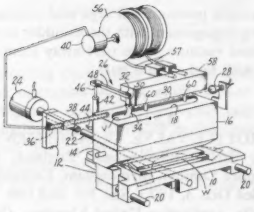
on said second area urging the control member towards its open position, said sleeve having a stepped cylindrical internal surface, a tubular member extending into the interior of the control member and having a head of stepped cylindrical form engaging the interior of the control member on opposite sides of the step therein.

3,881,509

MECHANISM FOR MAINTAINING THE LEVEL OF A VISCOUS LIQUID

Albert E. Newton, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed Apr. 19, 1973, Ser. No. 352,714
Int. Cl. B05c *11/10*
U.S. Cl. 137—386 **9 Claims**



1. Mechanism for controlling the level of a viscous liquid in a container comprising means associated therewith for replenishing the liquid therein, means for directing a beam of light adjacent to the surface of the liquid, a sensor responsive to said beam for controlling operation of said liquid replenishing means and a plunger movable heightwise in the container and across the beam between a position wherein a portion of said surface is potentially contacted by at least the lower end of the plunger and an upper position wherein said lower end is above said beam, the arrangement being such that upward movement of the plunger following its contact with the liquid in the container when the liquid surface level therein is adequate raises a liquid curtain blocking the beam, and when said level is inadequate the upward movement of the plunger is ineffective to produce a beam-blocking curtain whereupon the sensor signals for operation of said replenishing means.

3,881,510

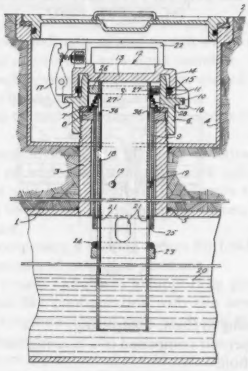
VALVED VAPOR SEAL FOR UNDERGROUND TANKS

William B. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 2, 1974, Ser. No. 430,333
Int. Cl. F17d *1/00*
U.S. Cl. 137—590 **2 Claims**

1. In a subterranean tank for the storage of a liquid hydrocarbon, the tank having a gauge conduit extending from the upper portion of the tank to ground level, a valve which prevents the flow of hydrocarbon vapors to the atmosphere while permitting passage of a gauge stick therethrough comprising: a. a tube passing from the ground level, downwardly through the gauge conduit, and terminating below the surface of the liquid in the tank, having an opening in its wall adjacent the top of the tank,

b. and means for selectively covering or uncovering said opening, thereby preventing the flow of hydrocarbon



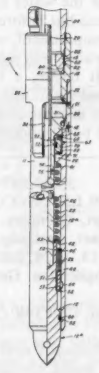
vapor through the valve while permitting a gauge stick to pass through the valve to the tank bottom.

3,881,511

WELL SAFETY VALVE

William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 428,395
Int. Cl. F16h *17/02*
U.S. Cl. 137—460 **9 Claims**



1. A well safety valve comprising: a valve housing having a bore and adapted for connection with means for supporting said safety valve in a tubing string; said housing having ports for admission of well fluids to said bore; means defining a valve seat around said bore on a first side of said ports in said housing; flow rate responsive pressure reducing means in said housing on the opposite side of said valve seat from said ports; a valve member movable in said housing and engageable with said valve seat for shutting off flow through said bore from said ports; a valve operator piston connected with said valve member and movable in sealed relationship in said housing; said operator piston having a first portion thereof exposed to

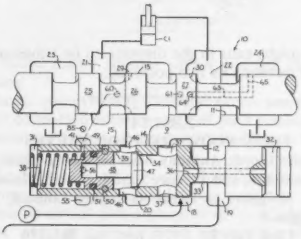
well fluid pressure; passage means extending to the low pressure side of said flow rate pressure reducing means for communicating a flow rate related reduced fluid pressure to an opposite second side of said operator piston for applying a flow rate related pressure differential across said piston for closing said piston when the well fluid flow rate through said valve exceeds a predetermined value; and means for biasing said operator piston in a direction to open said valve.

3,881,512

HYDRAULIC CONTROL VALVE AND PRESSURE COMPENSATING MECHANISM THEREFOR

Raud A. Wilke, Brookfield, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Sept. 21, 1973, Ser. No. 399,527
Int. Cl. F15b *11/08*; F16k *11/10*
U.S. Cl. 137—596.13 **17 Claims**



13. A control valve instrumentality having an inlet, an outlet, an open center passage connecting the inlet with the outlet, a pair of valve spools, one upstream from the other, each movable to an operating position to communicate an associated motor port with a feeder passage, and a pair of pressure compensating valve mechanisms, one for each valve spool, mounted in bores which are serially intersected by the open center passage and each having a plunger movable in a direction to establish communication of the associated feeder passage with the adjacent upstream portion of the open center passage in consequence of subjection of one end of the plunger to the pressure of fluid in the associated motor port when the latter is in communication with its associated feeder passage, characterized by:

A. the upstream one of said plungers being incapable of restricting the open center passage and consequently incapable of effecting build up in pressure in the upstream portion of the open center passage when in position communicating the latter with the associated feeder passage;

B. the other plunger having means thereon to effect restriction of the open center passage when moved in the direction to communicate the adjacent upstream portion thereof with the associated feeder passage;

C. and means operable to subject said end of said other plunger to the pressure of fluid in the motor port associated with the upstream plunger in said operating position of the upstream one of said valve spools.

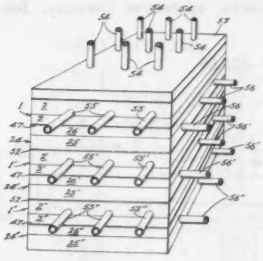
3,881,513

THREE-COORDINATE FLUID MANIFOLD

Robert C. C. Chang, Sao Paulo, Brazil, assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 25, 1974, Ser. No. 436,819
Int. Cl. F15c *3/06*
U.S. Cl. 137—608 **11 Claims**

1. A fluid manifolding arrangement comprising one assembly of first and second stacked manifolds; said first manifold having therein a plurality of spaced, parallel, elongated channels; said second manifold having therein a plurlaity of spaced, parallel, elongated channels which are orthogonally related to the channels of the first manifold, the channels of the first manifold crossing the channels of the second manifold to



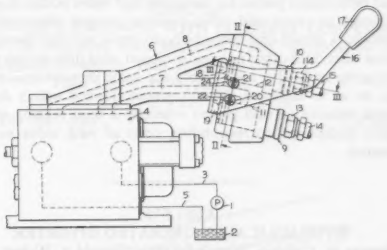
provide node junctions at the points where the channels meet; and means forming in said manifolds, at certain preselected node junctions, separate parallel channels which are orthogonally related to the channels of both the first and the second manifolds.

3,881,514

QUICK DISCONNECT COUPLING

David A. Berg, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 2, 1974, Ser. No. 430,194
Int. Cl. F16l *37/28*
U.S. Cl. 137—614.04 **10 Claims**



1. A hydraulic coupling means for use in a hydraulic system comprising, a housing defining radial passages and a first and a second bore having axes in parallel relationship, a coupling including, a socket section including a cylindrical casing means with a closed end mounted in each of said bores, locking means carried on said casing means, a locking sleeve engaging said locking means, resilient means biasing said sleeve to a normal locking position, a plug section including a tubular member for reception in said socket section, valve means in said coupling permitting flow through said coupling when said coupling is connected and interrupting flow when said coupling is disconnected, a release lever pivotally mounted on said housing, means pivotally supporting said lever for selective and alternative pivotal movement for selective release of said couplings, a pair of arms on said lever with each arm engaging the closed end of a mating of said casing means for selectively biasing said casing means against said resilient means to a disengaging position relative to said locking sleeve by pivoting said lever to release one coupling in a fore direction and in an aft direction to release the other coupling.

3,881,515

THREE-WAY VALVE

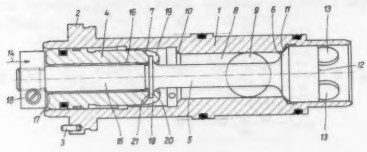
Gerhard Grieger, and Joaquin Bohrdt, both of Berlin, Germany, assignors to Siemens Aktiengeselischaft, Munich, Germany

Filed July 2, 1973, Ser. No. 375,744

Claims priority, application Germany, July 14, 1972, 2235515

Int. Cl. F15b *13/042*

U.S. Cl. 137—625.66 **4 Claims**



1. A three-way valve for reversing a fluid actuating device such as the kind used for actuating an electrical switching apparatus or the like comprising: a cylinder defining a valve-inlet passage, a valve-outlet passage and a space between said passages, said cylinder having an opening formed therein for connecting said space to the fluid actuating device; said cylinder further defining valve seats at said passages respectively; a single drive piston movable in said cylinder between first and second end positions, said piston being a differential piston and having an end-face portion facing said space, said end-face portion being configured as a valve-body corresponding to one of said passages; a second valve body corresponding to the other one of said passages; and, a valve rod carrying said second valve body and extending through said space and into said differential piston for coupling said valve bodies together to coact to cause said other passage to open when said one passage is closed and conversely, to cause said one passage to open when said other passage is closed, said differential piston engaging said valve rod to hold the same in wobble-like fashion so as to facilitate the movement thereof within defined limits relative to said piston whereby a firm seating of said valve bodies on corresponding ones of said valve seats is assured.

3,881,516

HYDRAULICALLY OPERATED DIVERTER

Thomas W. Childers, Woodland Hills; Ronald A. Weber, Ojai; John K. Rains, Ventura, all of Calif., and Benton F. Baugh, Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 15, 1973, Ser. No. 388,697

Int. Cl. F16k *11/00*

U.S. Cl. 137—625.44 **20 Claims**

1. Apparatus for diverting flow comprising:

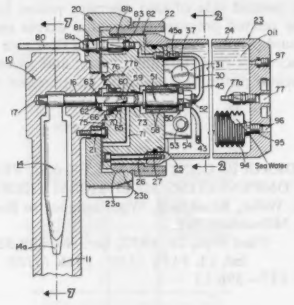
a flow diverter body member containing branched passageways joined together in a wye configuration;

a paddle arranged at the junction of said passageways and movable from one position in which flow through one of said passageways is blocked to another position in which flow through said other passageway is blocked;

a shaft nonrotatably connected to said paddle;

rotatable means connected to said shaft;

means for rotating said rotatable means including piston means and spring means, said piston means rotating said rotatable means against the bias of said spring means from one position of said rotatable means to another position of said rotatable means and said spring means rotating said rotatable means in a counter direction; and means on said piston means for limiting stress on said rotatable means, said shaft and said paddle, and for adjusting travel of said paddle to permit full rotation of said paddle from said one to said other position where differences might exist in the distance to be travelled by said paddle between its two positions.



3,881,517

FLUID FLOW CONTROL VALVES

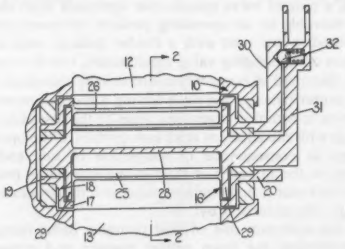
Arthur Leslie Lloyd; Anthony Michael Parry-Evans, both of Wolverhampton, and Terence John Capewell, Gnosall, all of England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed July 27, 1973, Ser. No. 383,250

Claims priority, application United Kingdom, Sept. 23, 1972, 44128/72

Int. Cl. F16k *11/00, 11/14*

U.S. Cl. 137—637.1 **2 Claims**

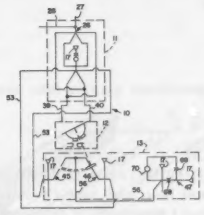


1. A fluid flow control valve comprising a body having a bore, an inlet port opening into said bore and at least one further port the connection of which to the inlet port is to be controlled, a first closure member in the form of a sleeve in said bore having an opening in communication with the inlet port and a port which is alignable with the further port so as to control the interconnection between the inlet port and said further port via the interior of the sleeve, a second closure member within the first closure member movable relative to the first closure member to cover or uncover said port therein, said closure members being operable in first and second distinct modes in the first of which said closure members move in unison to control the interconnection of said inlet port to said further port and in the second of which the closure members move relative to one another to control such interconnection, an input member on said second closure member for applying operating torque thereto; and spring loaded detent means acting between said first and second closure members and causing said closure members to be operated in said first mode when the torque applied is insufficient to overcome said detent means and in the second mode when the torque applied is sufficient to overcome said spring detent means.

3,881,518
MEMORY CIRCUIT FOR BINARY COUNTER

David J. Schaffer, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 1, 1974, Ser. No. 456,486
Int. Cl. F15c 3/00, 1/08
U.S. Cl. 137—821 8 Claims



1. A fluidic binary counter with a memory characteristic, comprising:

a. a fluidic circuit having a bistable fluidic amplifier with an inlet connected with a source of fluid pressure, a pair of control ports, spaced output ports and means for applying a counting signal;

b. indicator means responsive to fluid flow from said output ports to move between indicating positions;

c. a branch circuit with a plurality of "not" elements, each "not" element having an inlet connected with the source of fluid pressure, a vent port normally receiving and venting fluid supplied to said inlet, an output port connected with a control port of said bistable amplifier, and a control port for diverting fluid from the "not" element inlet to said output port;

d. means for directing a single fluid impulse to the control ports of said "not" elements when the source of fluid pressure is initially energized; and

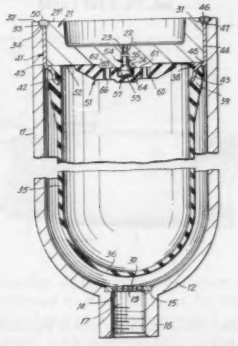
e. means dependent upon the position of said indicator means for blocking the application of the fluid impulse to the control port of a predetermined "not" element to prevent the direction of fluid from the output port of such "not" element to the respective control port of said bistable amplifier.

3,881,519
PRESSURE VESSEL

Abduz Zahid, Monterey Park, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 353,544, April 23, 1973, abandoned. This application June 5, 1973, Ser. No. 367,231
Int. Cl. F16l 55/04
U.S. Cl. 138—30 13 Claims

1. A pressure vessel comprising a container of rigid material having an opening at one end and an oil port at the other end, a deformable partition in said container intervening between said opening and said oil port and defining a gas chamber and an oil chamber on opposed sides thereof respectively, a rigid member secured in said opening and presenting a generally planar inner surface, said member having a bore therethrough defining a gas port having its inner end opening through said inner surface adjacent said gas chamber, a layer of resilient material generally paralleling and overlying said inner surface and defining a disc portion extending over the inner end of said bore, the periphery of said disc portion being bonded to the inner surface of said rigid member through which the inner end of said bore opens, the central portion of said disc portion being movable toward and away from said surface and having passage means therethrough with one end opening toward the rigid member inner surface whereby gas introduced under pressure through said gas port may be charged into the gas chamber, said passage means being positioned laterally remote from said gas port and between the bonded periphery and the axis of said portion, the central portion of said disc portion, in the relaxed position thereof, being retained against said surface of said rigid member and both closing and sealing said gas port by engagement of the disc portion against the

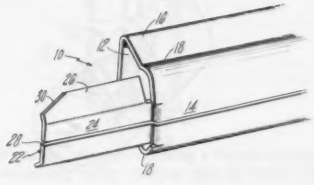


inner end of the bore and both closing and sealing said passage means by engagement of said one end of the passage means against the inner surface of the rigid member, said central portion upon movement away from said surface, opening both the gas port and the passage means to provide communication between said gas port and said gas chamber.

3,881,520
ONE-PIECE RACEWAY WITH INTEGRAL COUPLING

Robert H. Murphy, West Hartford, Conn., assignor to The Wiremold Company, West Hartford, Conn.

Filed Jan. 7, 1974, Ser. No. 431,090
Int. Cl. F16l 9/22, 21/00, 37/02
U.S. Cl. 138—109 7 Claims

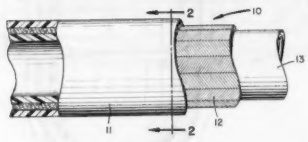


1. A raceway for electrical wiring and the like comprising an elongated tubular member of one-piece construction having an elongated base wall portion, a canopy portion integral with the base wall portion along its length and cooperating therewith to form an elongated enclosed raceway cavity, and a coupling portion integral with the base wall portion and extending longitudinally from one end thereof beyond the canopy portion, said coupling portion being offset from the base wall portion by a distance equal to at least the thickness of the base wall portion and having a lateral dimension slightly greater than the lateral dimension of the raceway cavity adjacent the base wall, said coupling portion and said base wall portion having a continuous narrow slot extending longitudinally through the coupling portion and along the base wall portion to impart flexibility and resiliency to the raceway and permit contraction of the coupling portion during assembly.

3,881,521
DIMENSIONALLY STABLE, FLEXIBLE HYDRAULIC HOSE HAVING IMPROVED CHEMICAL AND TEMPERATURE RESISTANCE

Hans A. Johansen, Mantua, and David D. Russell, Atwater, both of Ohio, assignors to Samuel Moore & Company, Mantua, Ohio

Filed Jan. 31, 1973, Ser. No. 328,367
Int. Cl. F16l *11/08*
U.S. Cl. 138—126 14 Claims

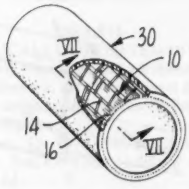


14. A flexible, dimensionally stable hydraulic hose comprising an extruded elastomeric core tube which has been cross-linked by irradiation with ionizing electrons, biased overlapping layers of reinforcing fibers tautly wound about the core tube in each direction at an angle of from about 50° to about 65° with the longitudinal axis of the core tube and preventing the expansion of the core tube while the hose is conveying fluids at pressures above atmospheric.

3,881,522
UNIDIRECTIONAL WEBBING MATERIAL

Albert Lewis, Covina, and Ronald G. Krueger, Azusa, both of Calif., assignors to Kaiser Glass Fiber Corporation, Oakland, Calif.

Division of Ser. No. 288,793, Sept. 13, 1972. This application Jan. 28, 1974, Ser. No. 436,974
Int. Cl. F16l *9/14*; D03d *15/00*
U.S. Cl. 138—144 1 Claim

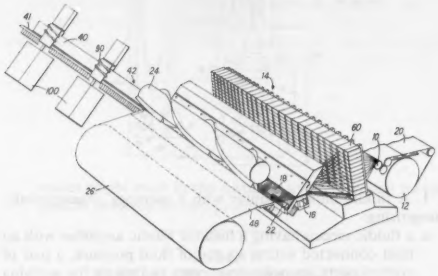


1. A plastic seamless pipe comprising a helically wound relatively distortion resistant unidirectional tape, said tape being comprised of a plurality of relatively widely spaced, smooth surfaced and parallel synthetic fiber warp strands intersecting glass fiber fill elements arranged in weft bundles that are interlaced with and arranged crosswise to said warp strands, the ratio of said warp strands to said weft fill elements being relatively low, said fill elements being bonded to said warp strands at their areas of intersection, said tape having a uniform coating of polymerized plastic fill material on each side thereof and providing a seamless hard walled pipe having said glass fiber fill elements substantially aligned with the longitudinal axis of said pipe.

3,881,523
WEAVING

Anthony David Paton, 51 Mills Lane, Longstanton St. Michael, and Stephen Temple, 9 Almond Grove, Bar Hill, both of Cambridge, England

Filed May 10, 1973, Ser. No. 358,910
Claims priority, application United Kingdom, May 10, 1972, 21902/72; Jan. 26, 1973, 4147/73
Int. Cl. D03d *47/26*
U.S. Cl. 139—12 29 Claims



1. A loom comprising:
a shedding section;
feeding means for feeding a plurality of warp yarns to said shedding section;
first and second gripping means for gripping a length of each one of said plurality of warp yarns, extending between said first and second gripping means, so that each length of warp yarn has a predetermined amount of slack;
a plurality of fluid flow means associated with respective ones of the lengths of warp yarn for creating gaseous fluid flow along at least one portion of each of the lengths of warp yarn, thereby applying longitudinal force to each length of yarn;
application of the longitudinal force in a first direction urging the length of yarn to be held in tension in said shedding section while a slack portion is formed at a second location remote from said shedding section, and application of the longitudinal force in a second direction urging the length of yarn to move so that a slack portion is formed in said shedding section while the yarn is held in tension at said second location;
a plurality of forming means associated with each of said fluid flow means, for forming the slack portion in said shedding section into a shed for the insertion of a weft yarn; and
shedding control means for controlling the shedding operation, by causing said plurality of fluid flow means to form a slack portion in each of said plurality of warp yarns in the shedding section according to a predetermined sequence.

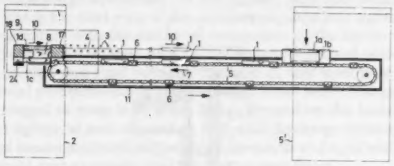
3,881,524
SHUTTLE RETURN APPARATUS

Hans Bracher, Burgdorf, and Heinz Baumann, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited

Filed Sept. 10, 1973, Ser. No. 395,560
Claims priority, application Switzerland, Sept. 8, 1972, 13195/72
Int. Cl. D03d *47/24*
U.S. Cl. 139—126 10 Claims

1. Shuttle return apparatus for a loom having picking and catching mechanisms on opposite sides of a shed-forming mechanism, said return apparatus comprising an endless belt adapted to extend from the catching to the picking side of the loom, means defining a shuttle guide path along one run of the belt, plural means arranged on the belt to propel shuttles along

said guide path, means to retard the motion of shuttles along said path, and a shutter retractably extensible across said



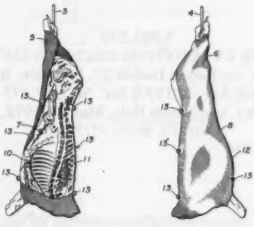
guide path between said picking mechanism and retarding means.

3,881,525

POLYESTER MEAT SHROUD

Witold R. Kocay, Creve Coeur, Mo., and James B. Denmark, Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 26, 1973, Ser. No. 400,870
Int. Cl. D03d *15/00*
U.S. Cl. 139—420 R **11 Claims**



1. Meat shrouds consisting essentially of a fabric, a major portion of which comprises a continuous filament yarn, a major portion of which comprises a manufactured filament in which the filament-forming substance is a long-chain synthetic polymer composed of at least 85% by weight of an ester of a dihydric alcohol and a dicarboxylic acid, said fibers being characterized by:

a. A denier from about 4 to 8;

b. A tenacity of at least about 4 gpd

said fabric being characterized by:

a. A simulated carcass relative moisture retention capability of at least 15%;

b. A skewer strength of at least about 80 lbs.;

c. A grab strength of at least about 200 lbs. in both warp and fill direction;

d. A fabric moisture absorption of no more than about 70%.

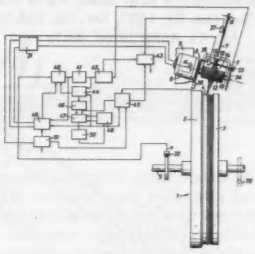
3,881,526

APPARATUS FOR MANUFACTURING ANNULAR BEADS

Robert Graham Bell, Hartlebury, England; James Edward Collins, and Gwylfa George Griffiths, both of Swansea, Wales, assignors to National-Standard Company Limited, Kiddermunster, Worcestershire, England

Filed June 1, 1971, Ser. No. 148,429
Claims priority, application United Kingdom, June 1, 1970, 26288/70
Int. Cl. B21f *3/04*
U.S. Cl. 140—92.2 **16 Claims**

1. Apparatus for manufacturing an annular bead, comprising a cylindrical former having a longitudinal axis, a circumferential recess in the former, means for rotating the former about said axis at a uniform speed, guide means for laying a length of wire in said recess circumferentially of the former, means for adjusting the guide means in the direction of said axis, a stepping electric motor for moving said adjusting means intermittently in the direction of said axis, and electronic control means controlling the supply of electric pulses intermittently to said motor to effect rotation of said motor according to a pre-chosen programme, whereby the adjusting means is moved through a predetermined programme of stepwise movements to cause the wire to be laid in said recess in a



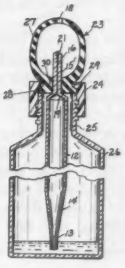
predetermined number of superimposed layers each consisting of a predetermined number of turns for the purpose of forming an annular bead of a predetermined cross-sectional shape, said electronic control means comprising a first manually settable unit for determining the number of turns of wire in each of said superimposed layers and a second manually settable unit for determining the number of superimposed layers.

3,881,527

BULB-OPERATED PIPET

Justin Joel Shapiro, 1802 Second St., Berkeley, Calif. 94710

Filed Jan. 3, 1974, Ser. No. 430,384
Int. Cl. B65b *3/04*
U.S. Cl. 141—24 **6 Claims**



1. A liquid transfer pipet comprising a barrel member having a liquid-receiving cavity portion and an intake conduit element at one end of said barrell member communicating with said cavity portion, the opposite portion of said barrel member being formed with a capillary bore coextensive in length therewith in communication with said cavity portion and opening at the opposite end of the barrel member, and a flexible operating bulb sealingly engaged on and slidably receiving said opposite portion, said bulb being formed with an upper vent opening adapted to be sealingly engaged at times by an operator, and wherein said opposite portion of the barrel member is of substantial length and of uniform cross-sectional size and shape and is much smaller than the bulb, whereby the bulb may be adjusted to a position along said opposite portion wherein said opposite portion projects upwardly a substantial distance through an opening in the bulb to define within said bulb above said opposite portion an air space and within said bulb below said opposite portion an overflow space of substantial volume in the bottom of the bulb around said opposite portion, and said upper vent opening

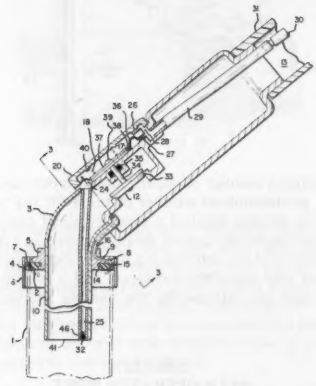
being in communication with said air space, and whereby liquid accumulating in said overflow space will not re-enter said capillary bore when the bulb is squeezed to discharge liquid from the pipet.

3,881,528

HOSE NOZZLE WITH SEAL SENSING SYSTEM

Elbert K. Mackenzie, 304 Britt Road, North Wales, Pa. 19454

Filed Oct. 23, 1973, Ser. No. 408,600
Int. Cl. B65b *57/06;* **B67c** *3/26*
U.S. Cl. 141—52 **7 Claims**



7. A gasoline hose nozzle for filling gasoline tanks having a filling neck comprising:

a flanged outlet spout,

a pressure seal mounted on the flange of said spout, said seal being constructed to mate with a matching surface on a filling neck,

a sensing chamber in said seal having an opening which mates with said filling neck to enclose said sensing chamber when said seal is mated with said filling neck,

a valve connected between said outlet spout and a source of said gasoline, and

a pneumatic sensing device connected to said sensing chamber, said sensing device being actuated when said seal is mated with said filling neck, said sensing device being connected to open said valve when said sensing device is actuated so that the gasoline flows through said valve only when said seal is mated with said filling neck.

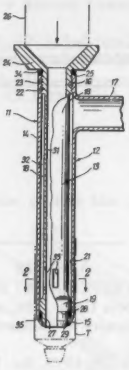
3,881,529

STRIPED TOOTHPASTE FILL NOZZLE

Giuseppe Mannara, Rome, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,624
Claims priority, application Italy, Dec. 6, 1972, 54513/72
Int. Cl. B67c *3/02;* **B05b** *7/00*
U.S. Cl. 141—100 **6 Claims**

1. A nozzle assembly for filling containers with fluent materials arranged in desired composite relation comprising longitudinally coextensive inner and outer tubular members removably secured together to form an annular space therebetween, said tubular members being threadedly connected at one end, means for introducing a first fluent material into one end of the inner tubular member, means forming a discharge opening at the other end of said inner tubular member, said inner tubular member having an enlarged portion adjacent its other end slidably fitting within the outer tube, means for introducing a second fluent material into said space, means providing a plurality of spaced orifices in said inner tubular member providing communication between said space and the interior of said inner tubular member, and resiliant sealing means between the tubes at opposite ends for preventing fluent material from leaving said annular space except through said orifices.

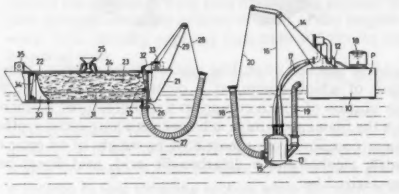


3,881,530

PLANT FOR EVACUATING DREDGED MATERIAL

Giovanni Faldi, via Forese Donati 27, Florence, Italy

Filed Apr. 3, 1973, Ser. No. 347,373
Claims priority, application Italy, May 17, 1972, 24498/72
Int. Cl. B63b *35/30*
U.S. Cl. 141—284 **4 Claims**



1. A plant for conveying and discharging at a distance dredged material in the form of an aqueous suspension, in which the dredged material is loaded into lighters at a dredging station for transport to a distance, characterized in that said plant comprises a floating flow pumping station provided with at least one and preferably a plurality of submerged pneumatic flow pumps, having, respectively, a plurality of inlet pipes at least one transporting lighter selectively operatively connected to or disconnected from said floating flow pumping station, said transporting lighter having a discharge connection, the inlet pipe of each pump being removably connected to the discharge connection of the transporting lighter arranged for shuttling between the dredging station and said floating flow pumping station, further characterized in that said lighter, provided preferably with its own drive means, comprises a completely closed loading cavity with an upper aperture for receiving the dredged material and a discharge aperture situated in the bottom of the cavity, said discharge aperture being arranged for connection by way of said discharge connection to said flow pump inlet pipe in said floating station, means provided in said cavity for conveying the dredged material filling said cavity towards said discharge aperture, said flow station comprises in addition to at least one submerged pneumatic flow pump a mooring corridor for the lighters, provided with fixed mooring points such as to dispose the lighter and in particular its discharge connection in a

predetermined position with respect to the submerged pump and in which are further provided means for bringing the inlet pipe of the submerged pump into tight communication with the discharge connection of the lighter, and said means for bringing the inlet pipe of the submerged pump into tight communication with the discharge connection of the lighter comprising a part shaped as a funnel generally coaxial with said inlet pipe and rigid with the free end of said inlet pipe, said funnel part terminating in a flat flange fitted with a seal gasket, arranged to mate with a flat flange formed on the bottom of the lighter at and concentric with said discharge connection, and means anchored adjustably downwards and rigid with said funnel part to ensure that the funnel part floats.

3,881,531

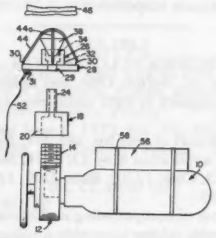
INFLATABLE SIGNAL DEVICE

Nicholas V. Rossi, 21 Greeley St., Sayville, N.Y. 11782

Filed Dec. 11, 1972, Ser. No. 314,279

Int. Cl. A63h *3/06*; **B64b** *1/58*

U.S. Cl. 141—313 **3 Claims**



1. A balloon in combination with a supply adapter and a balloon adapter, said adapters being adapted to communicate with each other in position of use, said balloon adapter having an opening therethrough and a seat surrounding said opening, a movable sealer member normally resting on said seat thus closing said ballon adapter, and movable means normally holding said sealer member in closed position on said balloon adapter seat, said sealer member being adapted to be moved away from said seat by pressure of gas from said supply adapter and thus move said movable means and permit gas to enter said ballon, the latter having a neck, said ballon adapter being mounted in said neck and said sealer member being within said neck, said balloon adapter having a flange in contact with the interior of said neck, and having an opening therethrough, said balloon adapter having an extension extending from said flange in the direction of the balloon and having an opening therethrough communicating with the opening in said flange, and saod opening in said extension having a greater diameter then said flange opening.

3,881,532

SEPARABLE BLADE CRADLE DEVICE FOR DELIMBING TREES

Eino J. Jouppi, Isabella, Minn. 55607

Division of Ser. No. 252,619, May 12, 1972, Pat. No. 3,814,151, which is a continuation-in-part of Ser. No. 3,941, Jan. 19, 1970, abandoned. This application Aug. 22, 1973, Ser. No. 390,587

Int. Cl. A01g *23/8*

U.S. Cl. 144—2 Z **4 Claims**

1. A separable blade cradle device for delimbing felled trees comprising:

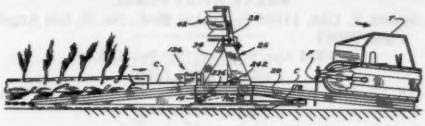
a. a base frame,

b. a flexible lower blade cradle for receiving a felled tree therein and encompassing the lower portion thereof.

c. means for supporting said lower blade cradle on said base frame with the blades in a U-shaped position,

d. a flexible upper blade cradle,

e. arm means pivotally mounted on said base frame and on which said upper cradle is mounted for pivotally lowering said upper blade cradle from a first position above, laterally removed and longitudinally offset from the lower blade cradle to a second and released position with the blades thereof upon and in engagement due to gravity



with and encompassing the upper portion of a felled tree positioned in the lower blade cradle with the upper blade cradle longitudinally offset from the lower blade cradle, such that said upper blade cradle and said lower blade cradle encompass a felled tree in said blade cradle device for delimbing the same, said upper cradle automatically lowering upon the tree and continually encompassing the tree due to gravity as the tree is progressed through the cradles and the diameter of the tree progressively reduces.

3,881,533

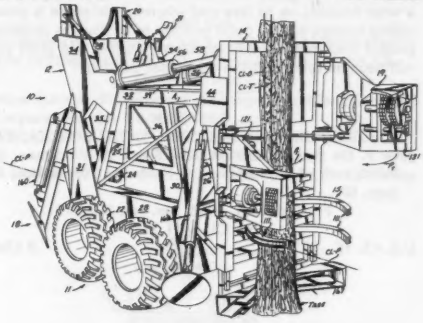
TREE HARVESTER

Donald D. Savage, 2883 Cobb St.; Robert V. Chambers, 2895 Robinson Rd., N.E., and Maurice T. Mills, 108 Margaret Ave., N.E., all of Marietta, Ga. 30060

Filed Sept. 29, 1972, Ser. No. 293,482

Int. Cl. A01g *23/00*

U.S. Cl. 144—3 D **31 Claims**



1. A tree harvesting machine including:

clamping means for gripping an upright tree adjacent its base;

cutting means for severing the tree at its base below said clamping means;

a prime mover for selectively moving said machine;

articulating means for shifting the tree from an upright position to a substantially horizontal position about an axis of rotation normal to the longitudinal axis of the tree and located above said clamping means when the tree is in its upright position, said articulating means including a support bed pivoted to said prime mover at its upper end for rotation about said axis of rotation normal to the longitudinal centerline of said prime mover to maintain substantially vertical alignment between said tree and said longitudinal centerline of said prime mover, said support bed mounting said cutting means at its lower end and mounting said clamping means above said cutting means; and

traversing means for moving said tree longitudinally of itself and said support bed after said tree has been felled, said traversing means including a plurality of gripping members selectively and drivingly engagable with said tree trunk, and power means for rotating said gripping members to selectively move said tree trunk.

3,881,534

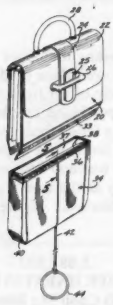
BREAK AWAY PURSE

Juanita V. Gist, 11605 S. Avalon Blvd., No. D, Los Angeles, Calif. 90061

Filed Apr. 5, 1974, Ser. No. 454,441

Int. Cl. A45c *13/20*

U.S. Cl. 150—33 **10 Claims**



1. A pocket book having an outer portion with an openable top and bottom, a purse detachable secured to said outer portion, an elongated cord attached to said inner purse with a wrist bracelet on its free end wherein said purse is secured tightly enough to said outer portion to be used as an integral pocket book but upon extraordinary pulling said inner purse will become released from said outer portion.

3,881,535

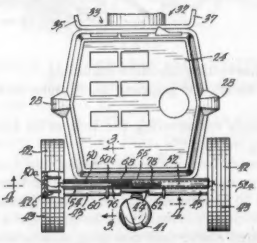
STAIRHOLDING DEVICE FOR VACUUM CLEANER

Jean P. Du Bois, Villa Park, and Roger A. Rieckman, Elmhurst, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed May 14, 1973, Ser. No. 360,149

Int. Cl. A47l *9/00*

U.S. Cl. 15—327 E **8 Claims**



1. A household vacuum cleaner comprising an elongated housing having a front end from which a suction hose extends and a rear end, front wheel means and rear wheel means at said front end and at said rear end respectively, brake means mounted on said housing adjacent said rear wheel means to prevent rotation of said rear wheel means when said vacuum cleaner is in an inclined position on stairs, said rear wheel means engaging the tread of a stair to prevent said vacuum cleaner from sliding down the stairs, said rear wheel means comprising a pair of spaced wheels mounted on a fixed axis positioned adjacent the lower rear edge of said housing, said suction hose being adapted to drag said cleaner forwardly including up stairs, said brake means locking at least one of said rear wheels against rotation in a first direction preventing rearward movement of said cleaner while permitting rotation in the opposite direction to provide forward movement of said cleaner.

6. A vacuum cleaner comprising an elongated tank having means for attaching a suction hose to one end thereof, support means for said cleaner including a pair of wheels on said tank at the end remote from said one end, said wheels being mounted on a fixed horizontal axis which is positioned at the bottom of said tank with said wheels extending substantially below said tank to engage a substantial portion of a stair tread when said cleaner is in an inclined position on said stairs with said one end up and the other down, ratchet means on said tank engageable with said wheels to permit rotation of said wheels when said tank is moved in a direction toward said one end and to lock said wheels when said tank is moved in the opposite direction, and manually operable means for rendering said ratchet means inoperative.

3,881,536

RUBBER VULCANIZATES

Thomas J. Doran, Jr., Norton, Ohio, and Roland H. Hess, Au, Switzerland, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 285,297, Aug. 31, 1972, abandoned. This application May 13, 1974, Ser. No. 469,566

Int. Cl. C08c *11/10;* **B60c** *5/00, 11/00*

U.S. Cl. 152—330 **20 Claims**

1. In the process of compounding a siliceous pigment reinforced sulfur curable rubber to provide a vulcanizable composition suitable for use in the manufacture of tires, the improvement which comprises including in the composition a silanated rubber coupling agent consisting essentially of the catalytic reaction addition product of (1) organohydrosilane having the dual functionality, A and B, wherein A is a functional group capable of forming a bond with a siliceous pigment particle and B is a hydrosilyl group and (2) synthetic unsaturated rubber polymer having at least 1 percent by weight of its olefinic unsaturation present, as pendant vinyl groups, said coupling agent furnishing from about 0.1 to about 3 parts of organohydrosilane equivalent per 100 parts of total rubber in the vulcanizable composition.

3,881,537

LINING AGENT FOR A TUBELESS PNEUMATIC TIRE

Teruhiko Miyazato, 18-7, Shiomi-cho, Sasebo, Nagasaki Prefecture, Japan

Division of Ser. No. 271,686, July 14, 1972, which is a continuation-in-part of Ser. No. 158,562, June 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 767,433, Sept. 4, 1968, abandoned. This application Feb. 5, 1974, Ser. No. 439,749

Claims priority, application Japan, Sept. 13, 1967, 42-78828

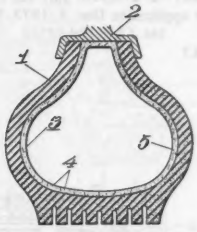
Int. Cl. B60c *21/08*

U.S. Cl. 152—347 **13 Claims**

1. A self sealing tubeless pneumatic tire comprising a tubeless pneumatic tire and a fluid tire lining agent disposed in the interior thereof, said tire lining agent including:

a. An adhesive consisting essentially of an aqueous emulsion of polyvinyl acetate, polyacrylic acid ester, butadiene-acrylonitrile rubber, polychloroprene or polychloroprene copolymer, said aqueous emulsion being
   i. dispersible in water; and
   ii. adhesive to finely divided particulate solid rubber particles, 100 parts of said aqueous emulsion being present per 18 to 54 parts of water; and
b. finely divided particulate solid rubber particles intimately dispersed in said aqueous dispersion, said finely divided particulate solid rubber particles having a particle size of

from about 50 to 1,200 microns and being present in an amount sufficient to seal a small puncture hole in said vehicle tire, said finely divided particulate rubber parti-



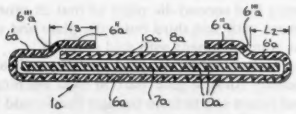
cles (b) having been added in their solid form to said adhesive (a), whereby the resultant mixture comprises said finely divided particulate solid rubber particles intimately admixed in said adhesive.

3,881,538

PNEUMATIC TIRES AND BREAKERS THEREFOR

Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, a Societe Anonyme, Clairoix, France

Filed June 6, 1973, Ser. No. 367,467
Claims priority, application France, Aug. 11, 1972, 72.29181
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 FP **9 Claims**



1. A pneumatic tire comprising a radial ply carcass having a crown region, a tread overlying said crown region, and a breaker assembly interposed between said tread and carcass, the breaker assembly comprising a first ply, a second ply overlying said first ply, and a third ply overlying said second ply, said first ply having a greater axial span than said second ply and terminating in a pair of folded marginal edge portions overlying at least in part said second ply, said third ply having a lesser axial span than said second ply and terminating in a pair of oppositely directed edges which are proximate and substantially coplanar with at least a substantial extent of each of said folded marginal edge portions of said first ply, each of said folded marginal edge portions of said first ply including a bent transition zone which divides said edge portions each into a pair of integral sections, one section of each of said edge portions overlying said second ply and being coplanar with said third ply, the other section of each of said edge portions overlying said third ply.

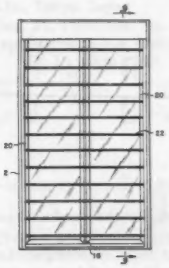
3,881,539

COMBINED WINDOW STRUCTURE

Raymond Falgas, Calle Guadalajara 382, Urb Valencia, Rio Piedras, P.R. 00923

Filed Nov. 29, 1971, Ser. No. 202,852
Int. Cl. E04f *10/10*
U.S. Cl. 160—107 **1 Claim**

1. As a new article of manufacture, a window closure for a wall opening, comprising a window frame having front and rear surfaces and the size and shape to fit in the wall opening, two transparent doors movably mounted on vertical hinges at the sides of the window frame to open or close the entire opening of the front of the window frame, a second frame having the same shape and substantially the same size as the interior of the window frame whereby it will snugly but movably fit within the interior of the window frame, the second frame being hinged at its upper end to the window frame between the front and rear surfaces thereof whereby it is normally in a depending vertical position between such front



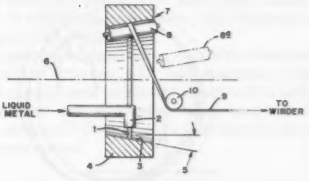
and rear surfaces and may be moved to a position within and inclined to the window frame with its lower part outside the window frame, a plurality of parallel horizontal louvers which are individually rotatably mounted in the second frame, means carried by the second frame for raising and lowering the louvers, and means carried by the second frame for rotating the louvers to open and closed positions.

3,881,540

METHOD OF FORMING METALLIC FILAMENT CAST ON INTERIOR SURFACE OF INCLINED ANNULAR QUENCH ROLL

Sheldon Kavesh, Whippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,855
Int. Cl. B22d *11/06*
U.S. Cl. 164—87 **2 Claims**



1. A process for the production of continuous length untwisted metal filaments from a molten stream comprising the steps of:

a. casting the molten stream on the inside surface of a rotating annular chill roll wherein the inside surface is inclined at an angle of 2°–30° to the axis of rotation of the chill roll;

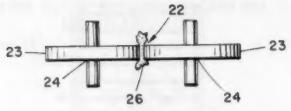
b. after solidification of the filament exerting pressure on the quenched molten stream in contact with the inside surface of the chill roll; to increase retention of the filament in contact with the quenching surface by nipping means applied on the inside surface of the chill roll; and

c. collecting the filament thus formed.

3,881,541
CONTINUOUS CASTING OF NARROW FILAMENT BETWEEN ROTARY CHILL SURFACES

John Robert Bedell, Sparta, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,483
Int. Cl. B22d *11/06*
U.S. Cl. 164—87 6 Claims

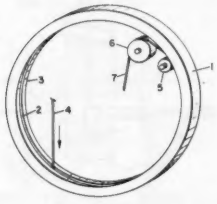


1. In an apparatus for the production of metal filaments from a molten stream ejected from a source of molten metal wherein the contact faces of contiguous cooperating rotary elements are used as the quenching source, the improvement which comprises orienting the rotary elements so that the molten metal is introduced into the nip thereof, providing contact faces on the rotary elements which allow unconfined lateral dispersion of the excess of said molten stream quenched on said contact faces, said contact faces comprising widths that are in the range of about 0.003 to 0.100 inch and are essentially coextensive with the width of the filament to be produced.

3,881,542
METHOD OF CONTINUOUS CASTING METAL FILAMENT ON INTERIOR GROOVE OF CHILL ROLL

Donald E. Polk, Morristown, and John R. Bedell, Sparta, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,720
Int. Cl. B22d *11/06*
U.S. Cl. 164—87 2 Claims

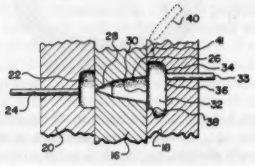


1. In a method of producing a shaped metal filament from a stream of molten metal deposited in a quenching groove formed in the inner periphery of a cylindrical chill roll wherein said quenching groove is provided immediately contiguous to the top thereof with a tapered opening of a material which has a substantially greater thermal insulating property than the chill roll, the improvement which comprises introducing the molten stream within the area defined by the width of the tapered opening afforded by said insulating material whereby said insulating material is not wetted and quenching said stream in said groove.

3,881,543
METAL DIE CASTING AND METHOD OF DEGATING

Karl Hannes, White Plains, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

Division of Ser. No. 274,910, July 25, 1972, Pat. No. 3,854,521. This application Dec. 3, 1973, Ser. No. 421,154
Int. Cl. B22d *27/10*
U.S. Cl. 164—113 4 Claims



1. A method of degating and ejecting a metal cast part formed in a die comprising

positioning a first outer die plate having a first recess therein so that it is in abutment with one side of a second inner die plate having an opening therethrough, said first recess being in alignment with said opening, said opening having a reduced cross section at the junction of said first recess that is less than the cross section of said first recess at said junction;

providing a third outer die plate having a second recess with an undercut edge portion;

positioning said second die plate so that its other side is in abutment with said third outer die plate and said second recess is in alignment with said opening;

injecting molten metal into said opening and said recesses to thereby form a gate part in said opening and said second recess and to form the cast part in said first recess;

moving said third die plate away from said second die plate thereby separating said gate part from said cast part due to the reduced cross section of said opening at the junction with said first recess;

then ejecting said gate part from said third outer die member by pivoting said gate part out of said second recess about said undercut edge portion; and

moving said first die plate away from said second die plate and ejecting said cast part therefrom after said first mentioned step of moving said third die plate.

3,881,544
MOLD OSCILLATING APPARATUS

Jose A. Botta, Jr., Pittsburgh, and Dale K. Beachy, Finleyville, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 11, 1974, Ser. No. 432,766
Int. Cl. B22d *27/08*
U.S. Cl. 164—260 4 Claims

1. Apparatus for oscillating a vertical flow-through continuous casting mold comprising:

a. a mold table supporting said mold;

b. means supporting said mold table;

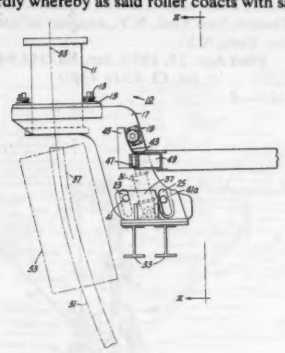
c. a pair of members fixed adjacent and coacting with said means supporting the mold table in such a way that said means moves along a preselected path;

d. a roller mounted to said means supporting the mold table and movable therewith;

e. an arcuate guide fixed adjacent to and coacting with said roller; and

f. powered means engaging the mold table supporting

means for moving said supporting means upwardly and downwardly whereby as said roller coacts with said arcuate guide and as said fixed members coact with the supporting means, said mold oscillates along an arcuate path.

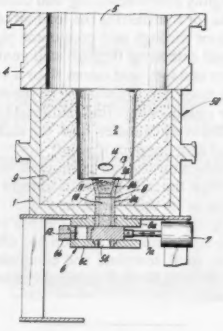


3,881,545

APPARATUS FOR CASTING COMPOSITE CAST ROLLS

Heinz Dieter Braukmann, Duisburg, and Wolfgang Hattwig, Rheinkamp, Baerl, both of Germany, assignors to Rheinstahl Gieberei

Filed Feb. 4, 1974, Ser. No. 439,527
Int. Cl. B22c *9/28*
U.S. Cl. 164—349 **6 Claims**



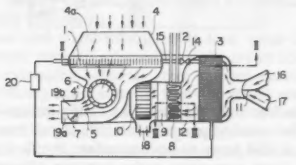
1. An arrangement for casting composite cast rolls having a hard shell and a soft core, comprising a bottom molding box having a lower roll pin cavity for forming the lower roll pin, a permanent mold for the roll body having a molding part with an upper roll pin cavity for the upper roll pin and which overlies the lower roll pin cavity, a pouring conduit for the shell material connected laterally into said bottom molding box, a trestle supporting said bottom molding box, a valve connected to the lower end of said bottom mold box and having an opening for discharging the excess shell material after the solidification of the desired thickness of the shell to be formed, a refractory tubular drain brick connected between said slide valve and said lower roll pin cavity and being filled with a granular refractory material and being located in the bottom of said bottom molding box, and a thin refractory plate covering said drain brick and resting on the granular refractory material flush with the top surface of said drain brick and completely closing the interior of said drain brick.

3,881,546

AIR CONDITIONER FOR AUTOMOTIVE VEHICLES

Yoshinori Otsuka; Masakatsu Hayashi, both of Tokyo; Jun Ichi Mantoku, Yao; Susumu Yamazaki, Tokyo; Akira Tomita, Hitachi, and Masanori Musou, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1973, Ser. No. 390,304
Claims priority, application Japan, Sept. 1, 1972, 47-87168
Int. Cl. B60h *3/00*
U.S. Cl. 165—42 **10 Claims**



1. An air conditioner for installation within an automotive vehicle comprising:

compressor means,

condenser means in fluid flow communication with said compressor means for receiving refrigerant to be condensed from said compressor means, said condenser means being disposed within a condenser casing having a bottom portion, said condenser casing also having an inlet directed toward a front portion of the vehicle and an outlet opened at a side portion of the vehicle,

condenser cooling fan means disposed between said condenser means and said outlet,

a duct casing provided with two air inlets adapted to receive air from a vehicle compartment and from the atmosphere surrounding the vehicle, respectively, said duct casing also being provided with an outlet opened into a vehicle compartment,

refrigerant evaporator means arranged within said duct casing in fluid flow communication with said condenser means, and heater means and duct fan means arranged within said duct casing with the heater means downstream of said evaporator means, said evaporator means having a lower portion, and

said duct casing being assembled with said condenser casing as a unitary structure with said evaporator means arranged opposite said condenser means within said unitary structure and with said heater means and said duct fan means arranged between said condenser means and said evaporator means.

3,881,547

HEAT TRANSFER DEVICE EMPLOYING FINS IN A FLUID STREAM

Gordon R. Lavering, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.

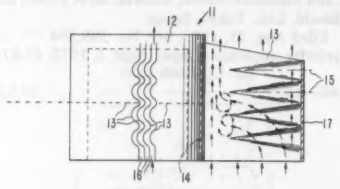
Filed Nov. 12, 1973, Ser. No. 415,068
Int. Cl. F28f *7/00*
U.S. Cl. 165—80 **6 Claims**

1. In a heat transfer apparatus for transferring heat between a device and a stream of fluid wherein said device comprises an elongate member and a sleeve surrounding said elongate member and where said stream of fluid flows between said elongate member and said surrounding sleeve member

an arcuate array of circumferentially-spaced thermally-conductive fins coupled in heat-exchanging relationship

with said elongate member and extending outwardly therefrom, each of said fins being corrugated into a wave-like configuration, the mean plane of the wave-like configuration of each of said fins being generally parallel to the axis of revolution of said arcuate array;

the wave amplitude of said wave-like configuration increasing with increase in radial distance along said mean plane outward from said axis of revolution of said array;



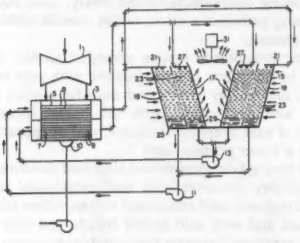
the wave fronts of said wave-like configuration for each of said fins running generally laterally of said axis of revolution of said array to accommodate the flow of coolant fluid along serpentine paths between adjacent ones of said fins parallel to said axis of revolution so that coolant fluid flowing between adjacent fins in proximity to the outer perimeter of said array of fins traverses a flow path which is longer than the flow path for coolant fluid flowing nearer to said axis of revolution of said array.

3,881,548

MULTI-TEMPERATURE CIRCULATING WATER SYSTEM FOR A STEAM TURBINE

Robert J. Budenholzer, Oakland, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 14, 1971, Ser. No. 162,364
Int. Cl. F28b *1/02*
U.S. Cl. 165—110 **2 Claims**



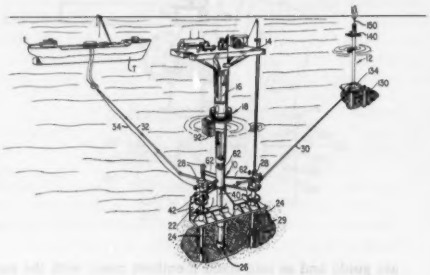
1. A condensing system for condensing steam comprising a condenser having a first heat exchanger through which a circulating fluid flows and being disposed so as to be contacted by influent steam entering said condenser and a second heat exchanger through which a circulating fluid flows, a cooling tower having an upstream and a downstream heat exchange portion disposed to provide series air flow therethrough, said upstream heat exchange portion being contacted by influent air, said first heat exchanger being in fluid communication with said upstream heat exchange portion of the cooling tower and said second heat exchanger being in fluid communication with the downstream heat exchange portion of said cooling tower, whereby the influent steam entering the condenser comes in contact with the heat exchanger portion of the condenser having the coolest circulating fluid to provide efficient condensing without subcooling.

3,881,549

PRODUCTION AND FLARE CAISSON SYSTEM

John P. Thomas, New York, N.Y., assignor to Interseas Associates, New York, N.Y.

Filed Apr. 27, 1973, Ser. No. 354,949
Int. Cl. E21b *43/01*
U.S. Cl. 166—.5 **10 Claims**



1. A caisson system for offshore oil production comprising:

a. a template positioned on the ocean floor and confined essentially to the mudline thereof, said template being preformed with circumferentially spaced openings around the periphery thereof and a central opening;

b. a plurality of hollow conductor pipes extending through said peripheral openings and firmly anchored in the ocean floor, said pipes serving both as structural support members and as conduits through which the drilling and recovery operations can be performed;

c. means for rigidly interconnecting said conductor pipes to said template for transferring the load on said template to the ocean floor through said conductor pipes;

d. a hollow spud extending through said central opening in said template and into said ocean floor a sufficient depth to distribute loads into the soil and to receive the caisson;

e. means for rigidly connecting said spud to said template so as to effectively transfer load on said spud to said template and said conductor pipes;

f. a hollow production caisson positioned in said spud and extending below the mud line at its bottom end and above the water line at its upper end, and

g. means for rigidly connecting said caisson to said template whereby the forces on said caisson are effectively transferred to said spud, template and conductor pipes which collectively serve to form an integral supporting structure for said caisson.

3,881,550

IN SITU RECOVERY OF HYDROCARBONS FROM TAR SANDS

Charles B. Barry, Houston, Tex., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed May 24, 1973, Ser. No. 363,596
Int. Cl. E21b *43/24*
U.S. Cl. 166—272 **4 Claims**

1. In a process for recovering hydrocarbons from a subterranean deposit of hydrocarbons having high viscosities and including tar sands, oil and tar deposits by stimulation through the injection of a solvent into the deposit, the improvement which comprises:

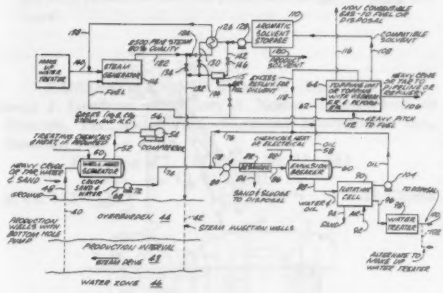
a. producing a solvent from the recovered hydrocarbons close to the recovery area;

b. heating the produced solvent to an elevated injection temperature of from about 200° to about 650°F;

c. injecting the heated solvent into the deposit to demulsify hydrocarbon-water emulsions and cut relatively heavy

hydrocarbons; and

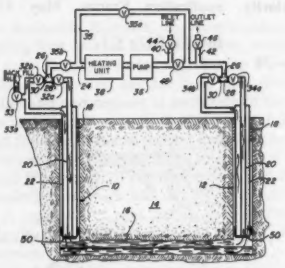
d. recovering at least a portion of the stimulated hydrocarbons as field-produced values and at least a portion as solvent for injection into the deposit.



3,881,551
METHOD OF EXTRACTING IMMOBILE HYDROCARBONS

Ruel C. Terry, and Xerxes T. Stoddard, both of Denver, Colo., assignors to Ruel C. Terry and Xerxes T. Stoddard, Denver, Colo.

Filed Oct. 12, 1973, Ser. No. 406,030
Int. Cl. E21b *43/24*
U.S. Cl. 166—272 **13 Claims**



2. A method of extracting gilsonite from a gilsonite formation in the earth with a solvent material comprising the steps of:

establishing an injection passage and a removal passage between a surface location and the gilsonite formation,

establishing subsurface communication in the gilsonite between the passages,

passing a heating fluid through the formation by injecting the heating fluid into the formation through the injection passage and removing the heating fluid through the removal passage until the temperature of the formation is above the melting point of the solvent material, and

passing the solvent material, which has the capability of dissolving gilsonite through the formation to dissolve contacted portions of the gilsonite formation by injecting the solvent into the formation through the injection passage and removing solvent along with the dissolved gilsonite through the removal passage.

3,881,552
SHUTTING OFF WATER IN GAS WELLS

James E. Hessert, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1973, Ser. No. 350,532
Int. Cl. E21b *33/13*
U.S. Cl. 166—294 **17 Claims**

1. A method for preferentially inhibiting production of water from a subsurface fluid hydrocarbon productive formation, the producing interval of which includes a watered-out portion and a portion capable of producing a substantial percentage of fluid hydrocarbon, comprising the steps of treating the producing interval by introducing into it a nonaqueous treating fluid, which on contact with water forms a water-impermeable gel, thereafter contacting the treating fluid with water then terminating the injection of said treating fluid and thereafter placing the treated formation on production, said treating fluid comprising:

a. at least one water-soluble or at least water-dispersible polymeric material selected from the group consisting of polyacrylamides, cellulose ether and polysaccharides;

b. an oxidizing agent selected from the group consisting of water-soluble compounds of polyvalent metals wherein the metal is present in its highest valence state and is capable of being reduced to a lower polyvalent state upon contact with a reducing agent;

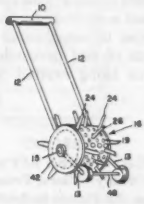
c. a reducing agent effective to reduce the higher valence metal in said oxidizing agent (b) to a lower polyvalent valence state; and

d. at least one polyhydric alcohol selected from the group consisting of glycerol, alkylene glycols, polyoxyalkylene glycols, and mixtures thereof; in amounts of each component identified as (a) to (d) as follows: from 0.001 to 10 parts of component (a) per 100 parts of component (d); an amount of component (b) at least sufficient to yield 3×10^{-6} gram-atoms of said metal (b) per gram of polymeric material (a) present; an amount of component (c) at least sufficient to reduce said metal (b) to a lower polyvalent valence state.

3,881,553
LAWN AERATING AND DRESSING MEANS

Joseph P. Angeski, Monroeville, Pa., assignor to A. I. Co., Altoona, Pa.

Filed Apr. 30, 1973, Ser. No. 355,549
Int. Cl. A01b *45/02*
U.S. Cl. 172—22 **9 Claims**



1. Means for the aerating and top dressing of a lawn in a single operation comprising means for receiving plugs of earth from the lawn, a plurality of pluggers mounted on and projecting from said plug receiving means for penetrating into the lawn surface and removing a plug of earth therefrom, said pluggers having a tubular construction for delivering removed plugs through the inner ends thereof to said plug receiving means and breaking means including a surface provided adjacent the inner end of each plugger, extending perpendicular to the axis of each plugger across the inner ends thereof and spaced therefrom a distance less than the length of a removed plug so as to be impinged upon by such plugs for causing plugs

entering said plug receiving means from said pluggers to be broken up, said plug receiving means including a hollow cylindrical member having a plurality of openings throughout the surface thereof through which the broken pieces of earth may pass onto the top surface of the lawn to provide a top dressing, said breaking means including a cylindrical weight means mounted concentrically within said cylindrical member, the periphery of said weight means providing said surface adjacent the inner end of each plugger.

3,881,554

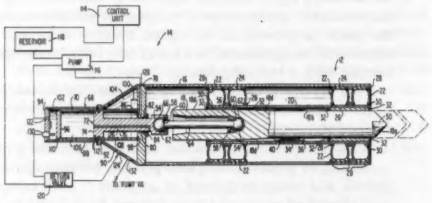
MECHANICALLY ACTUATED HAMMER AND BIT ASSEMBLY THEREFOR

William C. Cooley, 5400 Pooks Hill Rd., Bethesda, Md. 20014, and Franklin L. Beck, 3040 39th St., N.W., Washington, D.C. 20016

Filed May 25, 1973, Ser. No. 363,879

Int. Cl. B25d *9/04*

U.S. Cl. 173—13 **22 Claims**



1. In an assembly for mechanical impulse actuators having actuating means, the assembly comprising:

A. a tubular housing;

B. means for connecting said housing to a desired actuator;

C. a percussion bit;

D. means for connecting said percussion bit to the actuating means of the desired actuator; and

E. means supporting said percussion bit for rotational, lateral and axial displacement relative to said housing, said supporting means including:

a. guide means axially guiding said percussion bit during its axial displacement, said guide means being fabricated as a tubular structue which is arranged concentrically between said housing and said percussion bit;

b. spring means; and

c. means mounting said spring means between said guide means and said housing, said spring means exerting, as a result of said mounting means, both axial and lateral reactive forces in response to the axial and lateral displacements of said percussion bit, with said axial reactive force being exerted through said mounting means.

3,881,555

PUBLIC WORKS APPARATUS

Michel M. Cresp, Ormoy Villers, France, assignor to Societe Anonyme: Poclain, Le Plessis-Belleville, France

Filed May 16, 1974, Ser. No. 470,560

Claims priority, application France, May 21, 1973, 73.18363

Int. Cl. E21c *5/11*

U.S. Cl. 173—38 **2 Claims**

1. Public works apparatus comprising:

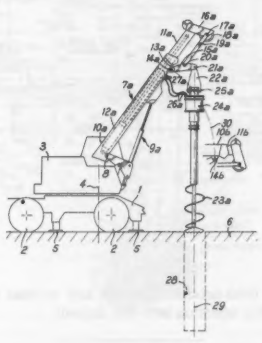
a frame;

a jib mounted on the frame, comprising at least two telescopic sections, of which a first section is mounted on said frame for pivotal movement about a first axis and a second section is slidable relative to said first section;

means for controlling pivotal movement of said jib and connected between said first section of said jib and said frame;

means for controlling relative sliding of said two sections and connected therebetween;

a member mounted on said first section of said jib for pivotal movement about a second axis parallel to said first axis;



a working tool freely suspended from said member; and

an arm pivotally connected to said second section of said jib and said member;

wherein pivotal movement of said member is controlled by said sliding control means and said arm.

3,881,556

PUBLIC WORKS DEVICE COMPRISES A BODY A TELESCOPIC JIB

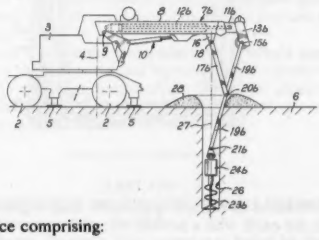
Michel M. Cresp, Ormoy Villers (Oise), France, assignor to Societe Anonyme: Poclain, Belleville, France

Filed May 16, 1974, Ser. No. 470,620

Claims priority, application France, May 22, 1973, 73.18585

Int. Cl. E21c *5/11*

U.S. Cl. 173—38 **5 Claims**



5. A device comprising:

- a body;
- a telescopic jib including at least two sections of which a first section is pivotally mounted on the body and a second section is mounted to slide relative to the first section;
- first control means for controlling relative sliding of the two sections and connected between the two sections;
- second control means for controlling pivoting of the first section relative to the body and which is connected between the first section and the body;
- a first link and a second link, the first link being connected to the first section by a first pivot, the second link being connected to the second section by a second pivot and the two links being connected together by a third pivot;
- a work tool which is freely suspended from the second link at a given point;

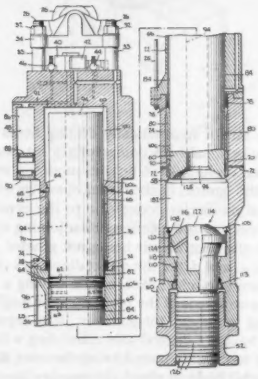
wherein the second pivot, the third pivot and the given point are aligned, the second pivot and the given point being situated to either side of the third pivot, and the distances separating the third pivot from, respectively, the first pivot, the second pivot and the given point are equal.

3,881,557

IMMERSED RAM HYDRAULIC HAMMER

George J. Gendron, and Henry A. Nelson Holland, both of Houston, Tex., assignors to Raymond International Inc., Houston, Tex.

Filed Aug. 27, 1973, Ser. No. 391,569
Int. Cl. E02d *7/10*
U.S. Cl. 173—131 **21 Claims**



1. In a hydraulic hammer, the combination of a closed casing having first, second and third bores, a ram reciprocally movable in said casing bores and having a central driving region slideable in said second bore and first and second smaller diameter end regions at each side of the central driving region and slideable within the first and third bores of said casing and forming first and second end chambers therein, an anvil having a blow receiving head in said first end chamber and located in the path of ram movement and further having a stem projecting through and closely fitted and sealed in an opening at one end of said casing in a manner permitting limited longitudinal movement of said stem in the direction of ram movement, fluid drive means operative to act on said central driving region for driving said ram reciprocally in said casing to impact against the blow receiving head of said anvil and pressure maintaining means for maintaining a continuous positive fluid pressure within said first and second end chambers to hold said anvil toward said one end with its stem projecting from said one end and in contact with an element to be driven, even during uplift reactions on said casing caused by the driving of said ram, said pressure maintaining means comprising means for supplying a pressurized fluid within said first and second end chambers and a first fluid passageway means connecting said end chambers.

3,881,558

PIPE THRUST MACHINE FOR HORIZONTAL DRILLING

Claudio Dolza, 66 Corso Francia, Turin, Italy

Filed May 29, 1973, Ser. No. 364,297
Claims priority, application Italy, June 9, 1972, 68843/72
Int. Cl. E21c *5/00*
U.S. Cl. 173—152 **15 Claims**

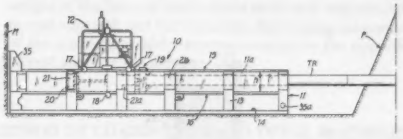
1. A horizontal earth boring and pipe laying machine comprising:

a runway bed delimited by two space longituidnal members;

a movable carriage located in the space delimited by the two longitudinal members, the movable carriage having a vertical longitudinal barycentric plane midway between said longitudinal members and being adapted to carry a pipe;

bearing and supporting wheels on said carriage for mounting the carriage so that it is movable along the runway bed;

a pipe thrust head on said carriage for thrusting forward into the earth a pipe located in said barycentric plane;



hydraulic driving means coupled to said carriage for advancing said carriage;

tenons lockable against axial movement relative to said runway bed to provide an abutment for the hydraulic driving means, said tenons being positioned to transmit the resultant reaction of the advancing thrust of the pipe to the runway in said barycentric plane; and

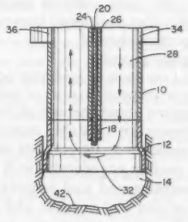
a hollow frame for slideably containing said reaction tenons, the pistons of the corresponding hydraulic driving means acting thereonto.

3,881,559

METHOD FOR STRESS WAVE DRILLING

Jay R. Allgood, Camarillo, and Robert J. Odello, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 402,547, Oct. 1, 1973, Pat. No. 3,840,078.
This application July 10, 1974, Ser. No. 487,344
Int. Cl. E21b *7/00*
U.S. Cl. 175—67 **1 Claim**



1. A method of drilling a bore hole in a rock comprising the steps of:

a. moving a bifurcated drill stem downwardly into the bore hole at a controlled rate of movement;

b. generating adjacent the bottom of said bore hole stress waves, said stress waves being created by placing a set of three electrodes in said drill stem adjacent to said rock and energizing said electrodes with electrical energy;

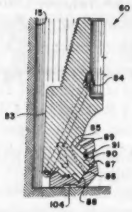
c. controlling the magnitude and duration of the generated stress waves such that said stess waves spall the rock at the bottom of said bore hole in the vicinity of said electrodes; and

d. circulating a flow of drilling liquid downward through one section of said bi...rcated drill stem and upwards through the the other section of said bifurcated drill stem.

3,881,560
DRILL TOOL

Edward B. Williams, Jr., 103 Mullaney Rd., Greenville, Tex. 75401

Division of Ser. No. 368,755, June 11, 1973, Pat. No. 3,844,363. This application Aug. 19, 1974, Ser. No. 498,745
Int. Cl. E21b 9/10
U.S. Cl. 175—337 5 Claims



1. A drill tool comprising:

a. a body member having a passage therein, said passage being in a pin portion of said body member and extending along a longitudinal axis of said body member and between a fluid receiving end and a closed end;

b. a plurality of circumferentially spaced arms extending from said body member adjacent the closed end of said passage in said body member;

c. a plurality of axle portions each extending from a respective one of said arms and along a respective axis intersecting the longitudinal axis of said body member in a manner to define a respective acute angle between the axis of the respective axle portion and the longitudinal axis of said body member, said axle portions each having an end surface and a shoulder positioned between a first portion and a second portion thereof;

d. a plurality of cutting cones;

e. means mounted on each of said axle portions for rotatably mounting a respective one of said cutting cones thereon for rotation about the axis of the respective axle portion, said means for rotatably mounting said cutting cones on said respective axle portions including a plurality of bearings each in engagement with a respective one of said axle portions and said respective cutting cone thereon, each of said first portions and each of said second portions of said respective axle portions having at least one of said bearings in engagement therewith;

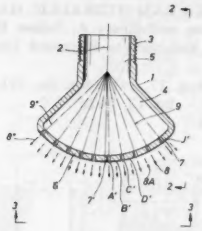
f. a flow passage for each of said arms and communicating with the passage in said body member, certain of said flow passages extending through said respective arms for flow of fluid therethrough and into a drill hole to remove drilling debris from the drill hole; and

g. a fluid passage for each of said axle portions and each extending between said respective flow passage and an exterior surface of said respective axle portion for flow of fluid to the respective exterior surface and communicating with said respective means for rotatably mounting said respective cutting cone thereon for lubricating same and said respective cutting cone thereon, the fluid passage for one of said axle portions communicating with said shoulder thereof, the fluid passage for the other of said axle portions communicating with the respective end surface thereof.

3,881,561
ROTARY BIT FOR HYDRAULICALLY DRILLING HOLES INTO UNDERGROUND FORMATIONS

Albert C. Pols, and Robijn Feenstra, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 25, 1974, Ser. No. 445,395
Int. Cl. E21b 7/18
U.S. Cl. 175—393 2 Claims



1. A rotary bit for hydraulically drilling holes into underground formations, said bit comprising a bit body having a central axis and a plurality of nozzles mounted in one end of the bit body, the centres of the outlet openings of the nozzles being arranged on circles concentric to the central axis, the distance between the intersections of adjoining circles with a plane through the central axis being not greater than 3/2 $(d_1 + d_2)$, wherein d_1 and d_2 are the outlet diameters of the nozzles on these adjoining circles, each nozzle having a central axis crossing the central axis of the bit body at an angle other than 90° and being arranged tangentially to a separate mathematical cone having a central axis coinciding with the central axis of the bit body, said cone having the apex thereof above the end of the bit body in which the nozzles are mounted, the apex angles of adjoining cones not differing more than 14°, and the largest apex angle being over 90°, and wherein the apices of the mathematical cones line in a common point on the central axis of the rotary bit, said bit having a lower surface arcuate in form, the centres of the outlet openings of the nozzles being arranged in said arcuate lower surface.

3,881,562
WEIGHING AND MEASURING APPARATUS FOR FODDER AND SIMILARLY COURSE MATERIALS

Myron C. Hesse, 2415 North 92nd St. (Apt. No. 4), Omaha, Nebr. 68114

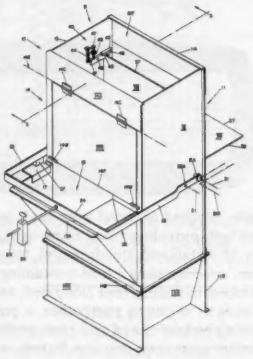
Filed Sept. 20, 1974, Ser. No. 507,750
Int. Cl. G01g 13/22
U.S. Cl. 177—83 10 Claims

1. A weighing and measuring apparatus especially adapted for heavy batches of fodder, silage, and similarly course material and comprising:

A. An upright chute having an open upright front-end to accommodate the paddles of a revolvable and vertically movable paddle-gate member and open top-end and bottom-end for respectively charging and discharging the material to be weighed, the chute comprising an upright left-panel and an upright right-panel having a fixed transverse distance therebetween, a planar upright door closure along the chute rear-end upper portion and having the door upper part pivotal about a horizontal transversely extending door-axis whereby the door pivotably swings rearwardly during paddle-gate revolvable ejection of a weighed batch, said upright door including a substantially horizontal transversely extending lower-edge, stabilization means for maintaining the door upright during charging of a material batch, and said chute further comprising a rearwardly flared trough spaced below the door lower-edge and converging toward the chute open bottom-end to direct a weighed batch downwardly-forwardly

theretoward after having been ejected by the paddle-gate through the rearwardly swinging door;

B. A generally horizontal balancing bail including transversely separated side arms located externally along the left-panel and the right-panel and further including a horizontal intervening bight portion located externally of the chute rear-end, said bail side arms having intermediate portions pivotably attached along a transversely extending horizontal bail-axis to the chute left-panel and right-panel, and a weighing beam member extending rearwardly from the bail bight portion;



C. A paddle-gate member located within the chute having a transversely extending and vertically reciprocatable paddle-axis that is revolvable secured to the bail side arms forwardly of the bail-axis, said paddle-gate member having more than two spaced apart paddle members extending radially outwardly from the paddle-axis, each paddle having a pair of transversely separated exposed radial free-edges which are spaced a finite-gap inwardly away from the chute left-panel and right-panel; and

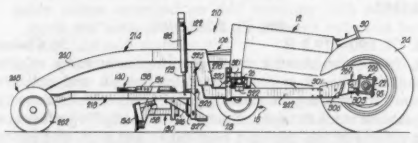
D. Stop-means for the uprighted paddles and secured within said chute at a level above said vertically reciprocatable paddle-axle and spaced therefrom a distance approximately equivalent to the radial dimension of the respective paddles.

3,881,563

GRADER BLADE ATTACHMENT FOR TRACTORS

Albert A. Hammersmith, c/o Al Hammersmith & Son Mfg. Co., 5th & Central Ave., Horton, Kans.

Filed July 31, 1972, Ser. No. 276,706
Int. Cl. B60d *7/00*
U.S. Cl. 180—14 **10 Claims**



1. In a mobile assembly:

a single, powered vehicle defining a prime mover having a chassis provided with rear drive wheels and a front wheel and axle structure having a steering mechanism;

an elongated, tool-supporting frame extending forwardly of said axle structure and provided with a front wheel and axle unit having a steering apparatus, said tool-supporting frame being adapted to carry a tool between said axle unit and said drive wheels;

releasable means securing the tool-supporting frame to the chassis in a substantially rigid manner to prevent relative movement between the frame and the vehicle; and

a coupling including a linkage assembly between said steering mechanism and said steering apparatus for rendering the latter responsive to actuation of said steering mechanism,

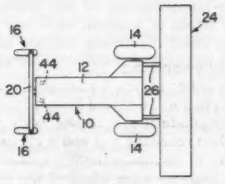
said tool-supporting frame and said axle unit maintaining said axle structure off the ground for transferring the weight of the front of said vehicle from said axle structure to said axle unit and for rendering the turning movements of the mobile assembly responsive solely to the operation of said steering mechanism.

3,881,564

METHOD OF LOADING AGRICULTURAL MACHINES ON A RAILROAD CAR

Merlyn Duane Bass, and Ralph August Gerhardt, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 27, 1973, Ser. No. 354,994
Int. Cl. B62d *61/00*
U.S. Cl. 180—21 **1 Claim**



1. In a self-propelled vehicle having a body partly supported on a pair of forward drive wheels and including a pair of side frame members mounted on opposite sides of the body and a rear transverse frame member connecting the rearward ends of the side frame members, the improvement comprising: a longitudinal pivot means mounted on the rearward end of the body; a transverse rear axle structure removable mounted on the pivot means so as to pivot about an axis extending in the direction of motion of said vehicle; a first pair of vertical socket means respectively mounted on the opposite ends of the rear axle structure; a second pair of vertical socket means respectively mounted on opposite sides of the body adjacent the opposite side frame members and adjacent the rear frame member, inwardly and forwardly of the first pair of socket means, and a pair of caster wheel structures respectively having vertical pivot elements rotatably and removably mountable in the first or the second socket means, the caster wheels being mounted in the first pair of socket means when the axle structure is mounted on the vehicle and being mounted in the second pair of socket means when the axle structure is removed.

3,881,565

TAG AXLE EMERGENCY TRACTION DEVICE

Lloyd Parrish, 1036 Ash St., Deerfield, Ill. 60015

Filed Jan. 7, 1974, Ser. No. 431,074
Int. Cl. B62d *61/10*
U.S. Cl. 180—24.12 **7 Claims**

1. An emergency axle traction device intended for use on truck like vehicles having a pair of drive wheels mounted on the vehicle frame and connected by suitable transmission means to the vehicle engine, and a pair of idle wheels mounted

in tandem relationship relative to the drive wheels in close relationship thereto and supported on the vehicle frame for rotation relative thereto, the drive device intended for selective operation in a manner to effect the selective driving of the idle wheels by the drive wheels, the device comprising:

a pair of horizontally spaced apart supporting brackets adapted to be mounted to opposite portions of a vehicle frame intermediate said drive and idle wheels;

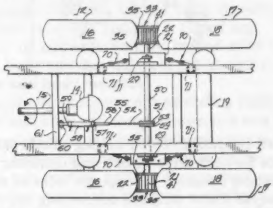
a pair of vertically disposed guide rods mounted on each support bracket and depending vertically downwardly therefrom;

a pair of horizontally spaced apart bearing blocks, each bearing block associated with a pair of guide rods for reciprocal vertical movement in an upwards and downwards movement therealong;

a cylindrical axle extending horizontally between said bearing blocks and projecting outwardly from opposite ends of said bearing blocks, said axle mounted in said bearing blocks for vertical reciprocal movement therewith;

a cylindrically shaped drum member rotatably mounted on each end of said axle for rotatable movement about the axis of said axle, the diameter of said drum being greater than the spacing between the nearest adjacent points of the tread portions of adjacent tandemly disposed drive and idle wheels;

operating means associated with each bearing block to selectively effect the vertical movement of said axle and said associated drums between an operative position where the circumference of said drums frictionally engages the treads of adjacent drive and idle wheels in a manner to effect the driving rotation of said idle wheel, and to an inoperative position where said axle and said



drums are disposed below a horizontal plane passing through the axis of said drive and idle wheels; and

each of said drum members is of a substantially identical construction, each drum comprising an elongated cylindrical hub member adapted to be received over an associated end of said axle for rotation thereabout, a pair of longitudinally spaced apart substantially flat disc members each associated with one end of the hub and affixed thereto in a manner defining a spool in conjunction with the hub, said disc members being of a circular configuration and having a plurality of circumferally spaced apart radially inwardly extending slots disposed completely about the circumference and opening out of the circumferal edge of each disc, the slots in each disc being in alignment with associated slots in the opposite disc, a plurality of substantially flat rectangularly shaped longitudinally extending members each having opposed end edges with each end edge having a rectangularly shaped recess in a top corner thereof, each of said members having a height and thickness corresponding to the height and thickness of said disc slots so as to be snugly received therein, each of said members having a longitudinal length greater than the spacing between the exterior opposed surfaces of said pair of discs such that the opposite ends of each member project outwardly of the exterior surface of each disc when the member is received in said aligned pair of slots, and a pair of ring shaped retaining members each adapted to be disposed adjacent an exterior surface of an associated disc member and each being of a size and configuration adapted to be received in part in the recess defined in each of said rectangular members projecting exteriorly of said associated disc member so as to retain said members in said slots to define the circumference of said drum.

3,881,566

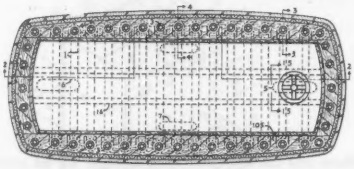
PIPE-FRAMED, INSULATED, LAND-TRAVERSING VEHICLE

Alvin Edward Moore, Manini Way, Diamondhead, Rt. 1, Bay St. Louis, Miss. 39520

Filed Dec. 26, 1973, Ser. No. 427,707

Int. Cl. B62k *17/16*

U.S. Cl. 180—30 **27 Claims**



1. A vehicle, adapted to travel over land, including:

vehicle-strength-providing body framework, comprising a plurality of juxtaposed, quadrilateral, tubular framework members, encompassing a load-containing space, each of said members including: four elongated, end-joined pipes, having axes at angles to each other; a pair of elbow fittings joining ends of one of said pipes to the adjacent ends of two other pipes; two junction fittings, connecting ends of a fourth pipe to the ends opposite to said adjacent ends of said other two pipes; one of the said four pipes, in each of said quadrilateral members, being a substantially horizontal floor pipe; bonding material between and connecting each of said fittings and the pipe-ends associated with it; and tie-members extending across said framework members and means connecting the tie members to said pipes, each of the said pipes having at least a part of its periphery contiguous to portions of at least one of said tie-members;

wheel-supporting means on said body framework, including: a plurality of auxiliary pipes, connected to said floor pipes, junction fittings between said auxiliary pipes and said floor pipes; and bonding material between and connecting each of said fittings and adjacent pipe ends;

exterior, waterproofed skin means, adjacent to said pipes and tie-members, contiguous to said tie-members; and

interior skin means on said pipes and tie-members, contiguous to said tie-members.

3,881,567

SERVO-ASSISTED STEERING ARRANGEMENT

Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Dec. 14, 1973, Ser. No. 424,784

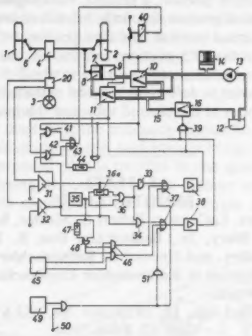
Claims priority, application Germany, Dec. 23, 1972, 2263347

Int. Cl. B62d *5/06*

U.S. Cl. 180—79.2 R **36 Claims**

1. In a servo-assisted steering arrangement for a vehicle including a servo system comprising: piston and cylinder means for actuating the steering gear of said vehicle; a source of pressure medium; a plurality of valves controlling admission and release of said pressure medium to and from said piston and cylinder means to actuate said piston and cylinder means; electrically actuatable control means for controlling operation of said plurality of valves; and sensing means for sensing actuation of a steering wheel of said vehicle and for providing an electrical control signal for controlling said electrically actuatable control means in response to said actuation of said steering wheel; the improvement wherein said electrically actuat-

able control means includes pulse generation means for providing a train of output pulses, and switch means responsive to said electrical control signal from said sensing means for



causing said train of output pulses to be applied to said valves for actuating same whereby pulsed operation of said valves occurs upon each actuation of said control means.

3,881,568

UNATTENDED TRAVELLING VEHICLE SYSTEM

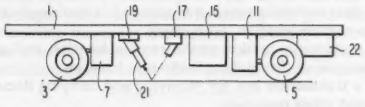
Shimon Ando; Koji Kurokawa, both of Hitachi; Shizuo Suzuki, Naka; Isamu Komatsu, Takahagi; Toshitaka Suzuki, Hitachi; Shigeyoshi Kawano, Hitachiohta; Masayoshi Sunada, and Kengi Natsuno, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1972, Ser. No. 310,956

Claims priority, application Japan, Nov. 30, 1971, 46-96875

Int. Cl. B60k *29/00*

U.S. Cl. 180—98 **9 Claims**



1. An unattended traveling vehicle system comprising:

a vehicle having carrying means to carry an object thereon, wheels provided at the underside of said carrying means in order to cause said carrying means to travel on a traveling path surface, steering means to guide said wheels to respective steering angles in fixed increments to either side of a center direction in response to the magnitude of an applied steering signal of proper sense, and driving means for driving at least one of said wheels;

guide means arranged on said traveling path surface to guide said vehicle and having a different reflection factor from said path surface;

light optical means mounted on said vehicle consisting of means to direct light on said path surface including said guide means and plural detector elements to receive reflected light from said guide means to generate individual guide signals, said light receiving detector elements being juxtaposed at the underside of said carrying means substantially over the width of said carrying means; and control means for producing a steering signal of proper sense having a magnitude varying in fixed increments representing a required steering angle in accordance with the respective guide signals generated by said light receiving detector elements.

3,881,569

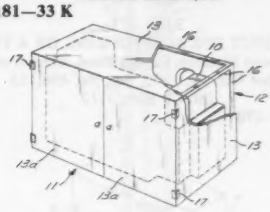
SOUNDPROOFING PANEL CONSTRUCTION

William O. Evans, Jr., 218 E. Streetsboro St., Hudson, Ohio 44236

Filed Sept. 6, 1973, Ser. No. 394,833

Int. Cl. E04b *1/86*

U.S. Cl. 181—33 K **19 Claims**



1. A soundproofing panel for covering machinery comprising, in successive laminations, a relatively rigid perforate wall, a thin sound-transmitting membrane, a relatively thick layer of low density void sound-absorbing material, and a layer of acoustically limp material of substantially greater density than said void sound-absorbing material, said membrane being formed of an imperforate, nonporous material that is chemically inert and substantially unaffected by fluids normally encountered in machinery environments, said perforate wall having an effective open area for sound transmission to said sound-absorbing material of at least **30** percent of its total area and having a mechanical strength sufficient to protect the membrane from puncture when struck by inadvertent blows from rigid objects, said membrane preventing passage of machinery fluids through said perforate wall into said void material and thereby avoiding contamination and loss of the sound-absorbing performance of said material.

3,881,570

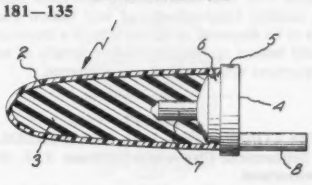
SELF-FITTING HEARING PROTECTOR

Frederick M. Lewis, Burnt Hills, N.Y., assignor to Marion Health and Safety, Inc., Rockford, Ill.

Filed Aug. 6, 1973, Ser. No. 386,146

Int. Cl. A61f *11/02*

U.S. Cl. 181—135 **1 Claim**



1. An ear protector adapted to be inserted into the ear, said ear protector comprising a resiliently yeildable elongated tubular envelope of substantially circular cross-section, said envelope being shaped generally as a bullet and tapering gradually and unidirectionally from a large diameter base end to a smaller diameter and rounded tip end, the base end of said envelope being open and the tip end of said envelope being closed, said envelope being made of a silicone polymer elastomer and being capable of being stretched to a length at least seventy-five percent greater than its original relaxed length and then returning to its original relaxed length, a mass of deformable polymer material filling and sustaining said envelope and conforming substantially to the shape of said envelope, said mass being deformed when said envelope is stretched in length and reduced in diameter for insertion into the ear canal, and then tending to resume its initial shape under the urging of said resiliently yieldable envelope as the latter returns toward its original length and diameter and swells into substantial conformance with the contour of the

ear canal, a plug telescoped into and bonded to the open base end of said envelope and serving to close said base end to retain said mass within said envelope, and a handle projecting outwardly from said plug to facilitate insertion of the envelope into and removal of the envelope from the ear canal.

3,881,571

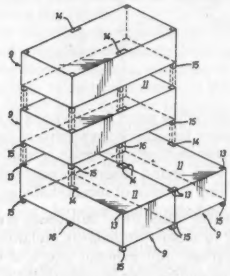
BUILDING UNIT FOR SCAFFOLDING OR A TRESTLE

Michael Maldwyn Moulton, Pawteg Road, Aberaeron, England

Filed Oct. 19, 1973, Ser. No. 408,113

Int. Cl. E04g *1/12*

U.S. Cl. 182—178 **6 Claims**



1. A building unit, for scaffolding or a trestle, comprising a hollow rectangular body having a length-to-width ratio which is an integer, and including a top forming a support platform and defining corner apertures at its corners and intermediate apertures at intervals of unit width along its length towards its edges with said intermediate apertures having a length in the longitudinal direction of said hollow rectangular body at least twice the corresponding length of said corner apertures, and a bottom having projections extending vertically downwardly therefrom, each projection in alignment with a respective aperture for engagement in the apertures of at least one other unit to locate said units in horizontal arrangement, the projections aligned with said intermediate apertures being offset from one another longitudinally of said hollow rectangular body so as to be disposed on either side of a transverse plane through said hollow rectangular body centrally of said intermediate apertures with which they are aligned.

3,881,572

TUBE CONNECTION, E. G. FOR A LADDER

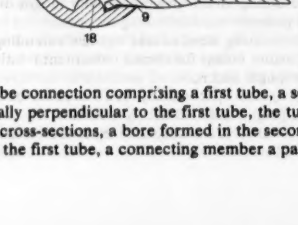
Heinrich Zenhausern, Birmensdorferstrasse 134, 8902, Urdorf, Switzerland

Filed Aug. 20, 1973, Ser. No. 389,662

Claims priority, application Switzerland, Aug. 25, 1972, 12703/72

Int. Cl. E06c *7/50*

U.S. Cl. 182—228 **2 Claims**



1. A tube connection comprising a first tube, a second tube substantially perpendicular to the first tube, the tubes having different cross-sections, a bore formed in the second tube for receiving the first tube, a connecting member a part of which is received in the open end of the first tube and the remainder of which abuts, directly or indirectly against the inner wall of the second tube, wherein the connecting member comprises a first, cylindrical portion, a second, frusto-conical portion, a third, cylindrical portion, a fourth, frusto-conical portion, and a fifth, cylindrical portion, the first portion being of greater diameter than the fifth portion, and the second portion, is of greater maximum diameter than the internal diameter of the first tube to assist in deforming the end of the latter against the edge of the bore in the second tube and the inner wall of the second tube.

3,881,573

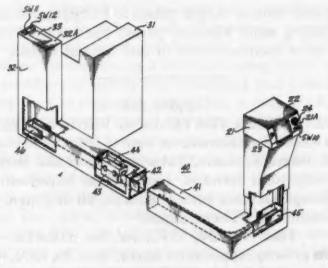
REMOTE TELLER

John L. Cotter, LaConner; Robert C. Melder, Sedro Woolley; Galen A. Biery, Jr., Bellingham; Dan E. Rothenbuhler, Sedro Woolley, and Howard E. Rothenbuhler, Acme, all of Wash., assignors to Rothenbuhler Engineering, Inc., Sedro Woolley, Wash.

Filed Apr. 19, 1973, Ser. No. 352,617

Int. Cl. E04h *3/04*

U.S. Cl. 186—1 R **18 Claims**



8. A remote teller for providing transmission of documents and other materials between a location in a banking institution and a remote location, comprising:

a. a customer station at the remote location and a teller station at the banking institution location,

b. a transaction box for receiving and carrying documents and other materials,

c. a monorail transportation system adapted for burial between said stations and including carrier means operative to move said transaction box between said stations,

d. at each of said stations, a housing extending from said monorail transportation system to an access point in the location, said housing including an access door at said access point, and

e. elevator means in each of said housings for receiving said transaction box from said carrier means and for moving said transaction box between said monorail transportation system and said access point.

3,881,574

MULTILEVEL SUPERMARKET LAYOUT

Jean-Marie Grange, 36 Les Haute de Marcouville, 95300 Pontoise, France

Filed Mar. 8, 1974, Ser. No. 449,359

Int. Cl. E04h *3/04*

U.S. Cl. 186—1 C **5 Claims**

1. A store arrangement particularly of a supermarket, comprising:

a plurality of seat-carriages, each one comprising a base provided with rolling means, a chassis resting on the base and a pivoting seat resting on said chassis, said seat-carriage being adapted to accommodate at least one customer sitting down;

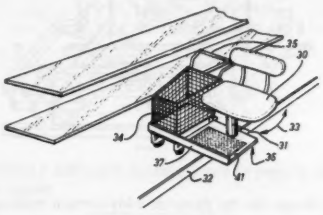
a plurality of basket-carriages each one consisting of a basket provided with rolling means, locking means adapted to removably connect the basket-carriages to the seat-carriages;

guide means in the form of rails located inside the store, adapted to guide the path of the seat-carriages;

a plurality of links for connecting the seat-carriages together, in the form of a continuous chain;

mechanical means adapted to move regularly said chain along the guide means;

shelves for displaying the products offered for sale disposed along said guide means, said shelves being constituted of two superposed planes parallel to the guide means, the shelves being disposed in such a manner with respect to said guide means, that the seat-carriages circulating on



said guide means are at a distance from the shelves enabling the products on the shelves to be taken by the customer on the seat-carriage;

detection means associated with each of said shelves sensitive to the removal of a product displayed on said shelf and suitable for emitting a corresponding signal;

at least one central computer for receiving and memorising the signals emitted by the detection means on each shelf; at least one means for measuring and checking the displacement of the chain formed by the successive linked seat-carriages, for sending signals corresponding to the instantaneous positioning of the chain of the seat-carriages within the circuit formed by the guide means;

transmitting means for transmitting the signals emitted by the checking means of the chain of carriages and by the detection means on the shelves to said central computer.

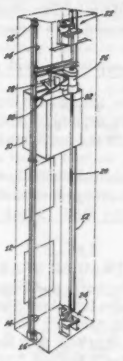
3,881,575

VERTICAL TRANSPORTATION AND ELEVATOR SYSTEM

Carlisle F. Manaugh, 522 Abramar Ave., Pacific Palisades, Calif. 90272

Filed Dec. 11, 1972, Ser. No. 314,178
Int. Cl. B66b *11/04*
U.S. Cl. 187—25 **7 Claims**

1. A vertical transportation and elevator system including: a vertical supporting frame having an upper end and a lower end; an elongated screw member; mounting means for suspending the elongated screw member in a vertical position on said supporting frame, said mounting means including an upper support means mounted at the upper end of said supporting frame and affixed to the upper end of said elongated screw member, and a lower support means mounted at the lower end of said supporting frame for receiving the lower end of said screw member, the lower end of said screw member being free to move in a vertical linear direction, said lower support means including a bracket to receive the lower end of said screw member and tensioning means connected to the lower end of said screw member to maintain said screw member in tension between the upper and lower support means for all load conditions of the system, said tensioning means including a resilient block member mounted coaxially with said screw member and engaging the under side of said bracket, and nut means threaded to the lower end of said screw member and engaging the underside of said resilient block; an assembly including a nut member threadably mounted to said screw member; an elevator cab; means coupling said elevator



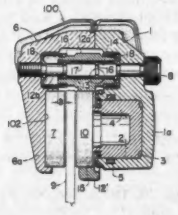
cab to said nut assembly; and drive means coupled to one of the aforesaid members for imparting relative rotational movement between said nut member and said screw member to cause said cab member to move vertically in a linear direction.

3,881,576

DISK BRAKE UNIT CALIPER MOUNTING

Tetsuo Haraikawa, Funabashi, and Yasuo Karasudani, Yokohama, both of Japan, assignors to Tokico Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 189,108, Oct. 14, 1971, abandoned. This application Sept. 25, 1973, Ser. No. 400,607
Claims priority, application Japan, Oct. 14, 1970, 45-90226
Int. Cl. F16d *65/00*
U.S. Cl. 188—73.5 **5 Claims**



1. A disk type vehicle wheel brake unit comprising:

a. stationary support plate means having a main part formed with a pair of ear portions each having a substantially T-shaped cross-section;

b. aperture means extending through each of said ear portions;

c. a circular opening formed through said main part in spaced relation to said ears;

d. C-shaped caliper means disposed in straddling relation to said main part and both of said ear portions and comprising first and second legs with actuator means disposed in said first legs;

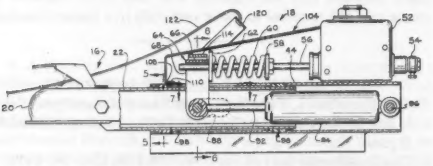
e. tie bolt means secured to said legs and extending through said aperture means for sliding movement relative to said support plate means;

f. a pair of spaced apart resilient seals disposed between said tie bolt means and said aperture means;

g. a first friction pad stationarily mounted on said second leg;

h. a second friction pad slidably mounted in said circular openings for enegagement by said actuator means;
i. said pair of tie bolt means extending parallel to the axis of said circular opening and having at least a portion thereof positioned inside of the outline of said circular opening as defined by two parallel lines tangent to opposite sides of said opening to act as a tension means opposed against an expanding force applied to said caliper means during brake application;
j. said caliper means acting as a compression means opposed against an expanding force developing in said caliper means during brake application; and
k. said ear portions, tie bolt means and said resilient seals being positioned in a substantially enclosed space defined by said C-shaped calliper means and said friction pads.

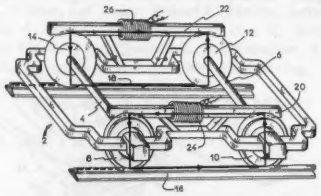
3,881,577
HITCH WITH TRAILER BRAKE ACTUATOR
Joseph L. Wherry, Perryburg, and Eugene DeAngelis, Toledo, both of Ohio, assignors to Toledo Stamping & Manufacturing Company, Toledo, Ohio
Filed Aug. 2, 1973, Ser. No. 385,188
Int. Cl. B60f *7/20*
U.S. Cl. 188—112 **19 Claims**



1. A trailer hitch for connecting a trailer and a towing vehicle, said hitch comprising a forward component adapted to be connected to the towing vehicle, a rear component adapted to be connected to the trailer, means associated with said forward and rear components for providing relative movement between them in a direction toward and away from one another, a brake cylinder carried by one of said components, a brake piston rod extending outwardly from said cylinder toward the other component, a spring connected to said brake rod at a point spaced from said brake cylinder and extending in a direction away from said brake cylinder, an engaging member movable with the other of said components for engaging said spring to resiliently urge the brake rod into said brake cylinder, stop means cooperating with said engaging members for limiting relative movement of said engaging member toward said spring, to establish a predetermined maximum compressive force on said spring, with said spring providing maximum pressure through and brake rod on hydraulic fluid in said cylinder which is less than the bursting pressure on a hydraulic system with which said cylinder communicates, and a break-away lever pivotally mounted on the same component as said brake cylinder, said lever having means being positioned to actuate said brake rod through said spring when said lever is moved by a flexible member attached to the towing vehicle.

15. A trailer hitch for connecting a towed vehicle and a towing vehicle, said hitch comprising a forward component adapted to be connected to the towing vehicle and a rear component adapted to be connected to the towed vehicle, said forward component being substantially tubular throughout a substantial portion of its length, said rear component including a pair of generally horizontally extending flanges and an inverted U-shaped portion structurally integral with the two flanges and of a size and shape to receive the tubular portion of said forward component, said flanges having rear turned up stiffening flanges with inner edges thereof affixed to the legs of said inverted U-shaped portion, and a strip member extending between lower end portions of the legs of said inverted U-shaped portion and affixed thereto below said tubular portion of said forward component.

3,881,578
APPARATUS FOR BRAKING RAILWAY VEHICLES
Yvon Dubreucq, 65, rue Faidherbe, Lesquin, Nord, France
Filed Nov. 6, 1973, Ser. No. 413,338
Claims priority, application France, Nov. 10, 1972, 72.40012; May 15, 1973, 73.17489; Sept. 13, 1973, 73.32877
Int. Cl. F16d *65/34*
U.S. Cl. 188—165 **6 Claims**

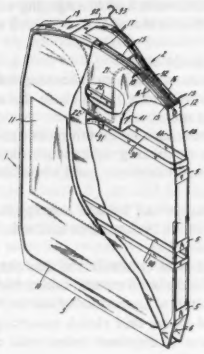


1. A device for the dynamic eddy-current braking of vehicles moving on rails of magnetic metal, and in which the wheels are also of magnetic metal, said device comprising:
at least two pairs of coaxial wheels with axles of magnetic metal;
as many excitation windings as there are coaxial wheels, each of said windings being mounted with a continuous clearance and surrounding the lower half of each of said wheels;
an induced magnetic circuit constituted by said lower halves of said two pairs of coaxial wheels, the portions of rail comprised between said wheels and the two axles of said wheels;
means for creating a magnetic flux through the intermediary of said windings, constituted by a source of electric current and a supply system for said coils with direct current from said source, comprising a switch;
and means for connecting to each other said windings of said two pairs of coaxial wheels, in order that in each vehicle said continuous current always circulates in the same direction in the windings surrounding the diagonally opposite wheels and always circulates in opposite directions in the windings surrounding said coaxial wheels;
whereby a magnetic flux adapted to generate effective retarding eddy-currents in said wheels and said rails is created at the required moment by closing said switch of said supply system for the windings and the various vehicles may be coupled together automatically in any direction whatever.

3,881,579
COMBINED SUITCASE AND HANGING BAG
Juri Keerdoja, 21 River Rd., Apt. A, Nutley, N.J. 07110
Filed Mar. 21, 1974, Ser. No. 453,205
Int. Cl. A45c *7/00*
U.S. Cl. 190—44 **16 Claims**

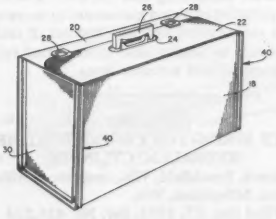
1. A suitcase having a top and a bottom, said suitcase including,
a handle,
means for mounting said handle in said suitcase between said top and said bottom, within a plane extending through said suitcase,
first and second hanger supports,
means for mounting said first hanger support in said suitcase above said handle, and to a first side of said plane, and
means for mounting said second hanger support in said

suitcase above said handle, and to a second side of said plane, said first and second hanger supports being



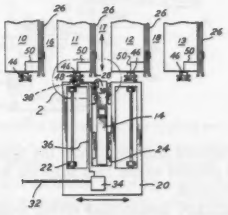
mounted a sufficient distance apart to provide access to said handle.

3,881,580
CARRYING CASE
Mandel A. Doppelt, 7218 Kedvale Ave., Lincolnwood, Ill. 60646
Filed May 14, 1973, Ser. No. 360,016
Int. Cl. A45c *3/00, 13/26*
U.S. Cl. 190—48 **4 Claims**



1. A carrying case comprising a body formed from a single integral strip or blank of plastic material which is substantially rigid but is capable of being longitudinally flexed by manual pressure, with said strip having spaced grooves formed in said material to provide fold lines for said strip so that when said strip is folded it forms a bottom, spaced side walls and a pair of top closure flaps with one of said flaps overlapping the other, said grooves between the side walls and the top closure flaps forming the hinge lines for said closure flaps, said body having separate end walls, in which the end walls are each formed of the same plastic material and provided with spaced marginal grooves which form fold lines for forming side end flanges and a bottom flange, said side end and bottom flanges positioned adjacent the margins of the side walls and bottom of said body, an integrally formed channel strip frame formed of metal and substantially rigid and which is of generally U-shaped configuration in end view plan comprising spaced vertical sides connected by a bottom horizontal portion but with an open top, said channel strip also being U-shaped in transverse section with an outer leg and an inner leg and a connecting portion therebetween and securing the side and bottom flanges to the end edges of the side and bottom walls, respectively, and not extending over the top of the end walls, said channel strip having inwardly extending pointed ribs on one of said legs biting into the side flanges to secure said end walls to the side and bottom walls without the use of any stitching or other fastening means and solely by the use of said integrally formed channel strip frame, said outer leg and connecting portion of said U-shaped channel strip being flat and each having a recessed flat central portion in the outer surface thereof.

3,881,581
VEHICLE POWER SYSTEM
Raymond H. Richardson, Chicago, Ill., assignor to Interlake, Inc., Chicago, Ill.
Division of Ser. No. 370,173, June 14, 1973, Pat. No. 3,846,595. This application Aug. 15, 1974, Ser. No. 497,659
Int. Cl. B60l *1/00*
U.S. Cl. 191—2 **6 Claims**



1. A vehicle power system including a plurality of stationary structures spaced from each other to define aisles therebetween and a structure movable across the ends of said aisles and including a vehicle movable in said aisles and to a position beyond said aisles, wherein the improvement comprises in combination therewith:

first power transmission means adapted to be connected to a source of power for transmitting power to said movable structure,

first coupling means mounted on said movable structure for movement with said movable structure in a defined path of movement adjacent the ends of the aisles, said first coupling means and said first power transmission means being connected for receipt of power by said first coupling means,

second power transmission means,

a plurality of second coupling means each stationarily mounted adjacent an end of said structures and adjacent the respective ends of said aisles and spaced in said defined path of movement such that said first coupling means moves into power transmitting engagement with given ones of said second coupling means when said vehicle is at least approximately aligned with a given one of said aisles,

and means associated with said given ones of said aisles connected to said second coupling means by said second power transmission means for energization of said means associated with said given one of said aisles when said first and second given ones of said coupling means are engaged.

3,881,582
PUNCH PRESS CLUTCH AND BRAKE WITH PRESSURE BOOSTER
William A. Conway, Cincinnati, Ohio, assignor to Conway Clutch Company, Cincinnati, Ohio
Filed Aug. 13, 1973, Ser. No. 388,031
Int. Cl. F16d *67/04*
U.S. Cl. 192—12 C **10 Claims**

1. In a punch press of the type including a driving motor, a flywheel connected to be driven by said motor, a punch, a cam shaft for driving the punch, and pneumatically actuated clutch means for selectively engaging said flywheel with said cam

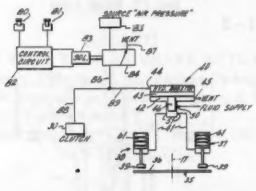
shaft in order to rotate the shaft and drive said punch when pressure air is supplied to said clutch, motion control apparatus comprising:

a braking disk positively secured to said cam shaft and including a braking surface on one side of said disk,

a source of pressurized air,

a pneumatic-hydraulic booster connected to said source of pressurized air and having an hydraulic output,

hydraulically deactivated spring applied brakes hydraulically connected to said booster and disposed to normally engage the side braking surface of said braking disk on opposite sides of the cam shaft to stop said braking disk, said spring applied brakes having braking pads mounted



to move toward and away from the braking surface in a direction parallel to the cam shaft on which the braking disk is mounted,

said hydraulically deactivated spring applied brakes normally braking said disk but being operable to disengage from said disk, in a direction parallel to the cam shaft, when pressure air is applied to said booster to hydraulically deactivate said brakes, and

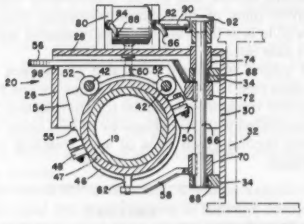
means for selectively and commonly connecting said source of pressurized air to said pneumatically actuated clutch means and to said booster to engage said clutch and disengage said brake and for selectively and commonly venting said clutch means and booster to that said brake is engaged whenever said clutch is disengaged.

3,881,583

FLUID OPERATED STEERING CLUTCH AND BRAKE

Ben C. Pezdark, and William C. Cleary, both of Butte, Mont., assignors to The Anaconda Company, New York, N.Y.

Filed Aug. 30, 1973, Ser. No. 393,178
Int. Cl. F16d *67/04*
U.S. Cl. 192—13 R **1 Claim**



1. In combination:

a. a power driven machine having

1. a frame,
2. a drive member, and
3. a driven member including ground engaging members, said drive and driven members being supported by said frame in coaxial and in substantial abutting relation;

b. a control mechanism for steering said power driven machine, said control mechanism comprising

1. a housing,
2. means mounting said housing on said frame,
3. clutch means,
4. means supporting said clutch means concentrically of said drive and driven members for movement in opposite directions selectively to positions engaging said drive member with and disengaging said drive member from said driven member and locking said driven member,
5. a pair of guide bars,
6. retainer means within said housing for supporting said guide bars in parallel relation to the axis of said drive and driven members,
7. means mounting said clutch means on said guide bars,
8. means for stabilizing said clutch means against rotation relative to said axis, said stabilizing means including
   i. a shaft supported by said housing for rotation about an axis which is normal to said axis of said drive and driven member,
   ii. a pair of arms connected to said shaft and extending toward said clutch means, said arms being connected to said shaft at spaced locations such that one arm is disposed above said clutch mounting means and the other arm is disposed below said clutch mounting means, and
   iii. means carried by one of said arms and said clutch mounting means for mechanically connecting the same, one of said arms providing an actuator lever extending from the location of said mechanical connection to initiate said selective movement; and

c. power assist means supported by said housing, said power assist means including

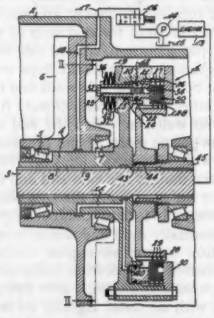
1. a cylinder,
2. a piston movable in said cylinder,
3. means to actuate said piston in opposite directions,
4. an actuating rod, said rod connected to said piston at one end, and
5. means for connecting said rod other end to said shaft for translation of piston movement to movement of said clutch means selectively into and out of said positions, said means to actuate said piston being responsive to movement of said actuator lever.

3,881,584

BALANCE SPRING FOR CENTRIFUGAL HEAD IN HYDRAULIC CYLINDER

James E. Marsch, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 17, 1973, Ser. No. 425,534
Int. Cl. F16d *25/00*
U.S. Cl. 192—85 AA **10 Claims**



1. A hydraulic clutch assembly comprising a rotating clutch drum carrying a plurality of clutch discs and defining an axis of rotation, a hydraulic cylinder defined by said rotating

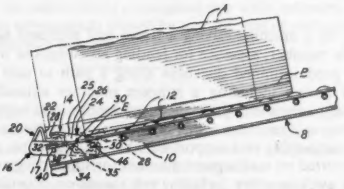
clutch drum radially spaced from said axis of rotation, a clutch hub carrying a plurality of clutch discs for engagement with the clutch discs on said drum, a hydraulic piston in said hydraulic cylinder forming a fluid pressurizing chamber for receiving pressurized hydraulic fluid for frictionally engaging said discs when actuating said hydraulic clutch assembly, retraction means for retracting said hydraulic piston including means defining an opening axially parallel with said axis of rotation extending into said pressurizing chamber through a wall in said hydraulic cylinder, a piston retracting sleeve removably received in said opening and firmly seated on said piston in said pressurizing chamber, a removable fastening member extending axially through said sleeve firmly seating said sleeve on said piston, resilient retracting means including a selective plurality of spring elements in axial adjoining engagement mounted externally on said hydraulic cylinder and compressively engaging a seating surface on said piston retracting sleeve and an external surface of said hydraulic cylinder providing a selective retractive force for retracting said piston and overcoming the effect of residual fluid pressure in the hydraulic fluid pressurizing chamber when the hydraulic clutch assembly is released.

3,881,585

SELF LEVELLING CONVEYOR STOP

Bestor P. Coleman, Willow Springs, and Kennedy McConnell, Riverdale, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed Mar. 30, 1973, Ser. No. 346,571
Int. Cl. B65g *11/20, 13/00*
U.S. Cl. 193—35 A **15 Claims**



1. A stop member for arresting the movement of an article on a conveyor comprising:

a movable arresting member having a substantially flat surface thereon of substantial area, said movable member adapted to be engaged by the article,

mounting means for movably mounting said movable member in the path of movement of the article, said mounting means including pivot means pivotally mounting said movable member intermediate the length of its surface at a location spaced substantially from the ends thereof,

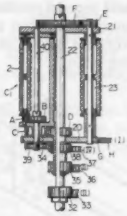
said movable member and said surface being pivotally movable about said pivot means between a first position in which said surface is disposed at an angle to and in the path of movement of the article and a second position substantially simultaneously with engagement of the article with said surface, wherein substantially the entire flat area of said surface frictionally engages a portion of the article in said second position and elevates said portion above the path of movement of said portion before said portion engaged said surface, whereby the movement of the article is substantially arrested.

3,881,586

PRINTING APPARATUS WITH LARGE NUMBER OF CHARACTERS

Tibor Arvai, Paris, France, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1973, Ser. No. 368,588
Claims priority, application France, June 20, 1972, 72.22162
Int. Cl. B41j *7/04*
U.S. Cl. 197—1 A **9 Claims**



1. A typing machine for selectively typing on a sheet a large number of characters, said machine comprising:

I. a printing assembly containing thereon a plurality of characters and mounted to bring a selected one of said characters to a printing position, said printing assembly comprising:

A. a first plate rotatable about a first longitudinal axis, a plurality of printing cylinders mounted on second axes rotatably mounted parallel to said first axis about the periphery of said first plate, said printing cylinders having about the periphery thereof rows of characters extending parallel to said first axis;

B. at least one carrousel including a second plate rotatably mounted about a third axis parallel to said first axis about said first plate between adjacent of said printing cylinders;

C. said at least one carrousel having a plurality of auxiliary printing cylinders rotatable about fourth axes, parallel to said first axis, about the periphery of said second plate, each of said auxiliary printing cylinders having about the periphery thereof rows of characters extending parallel to said first axis;

D. at least one row of characters, extending parallel to said first axis, fixedly mounted to said second plate about the periphery thereof between adjacent of said auxiliary printing cylinders; and

E. at least one row of characters, extending parallel to said first axis, fixedly mounted to said first plate about the periphery thereof between adjacent of said printing cylinders and said at least one carrousel; and

II. hammer means mounted adjacent said printing position for forcing a sheet against a selected one of said characters when said printing assembly has brought said selected character to said printing position.

3,881,587

DEVICE FOR CONTROLLING THE MOVEMENT OF THE PRINTING HEAD IN PRINTERS

Katsuhiko Okabe, Tokorozawa, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan

Filed Oct. 29, 1973, Ser. No. 410,559
Claims priority, application Japan, Nov. 1, 1972, 47-126456[U]
Int. Cl. B41j *3/20*
U.S. Cl. 197—1 R **1 Claim**

1. A device for controlling the movement of a printing head comprising:

a printing head having a printing portion thereon and movable along a recording surface of a recording paper faced

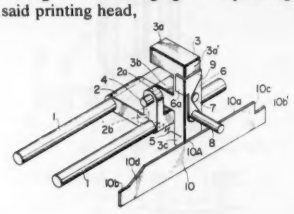
to said printing portion and also rotatable about an axis extending parallel to said recording surface between a first position with said printing portion contacting said recording surface and a second position with said printing portion removed from said recording surface,

an operating lever pivotably mounted on and engageable with said printing head,

a cam plate extending in parallel with said recording surface to engage said operating lever,

a first spring connected to said printing head and urging said printing head to said second position,

a second spring connected between said printing head and said operating lever and urging said operating lever to engage said printing head,



said cam plate having a slope portion at one end thereof engageable with said operating lever for moving said printing head against the bias of said first spring from said second position to said first position,

a low portion at the other end thereof engageable with said operating lever for allowing said first spring to urge said printing head to said second position from said first position, and

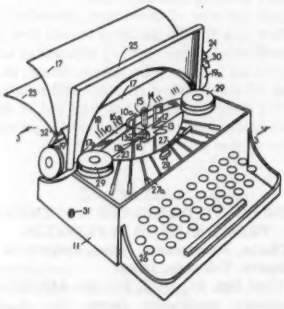
a high portion between said slope and low portions for maintaining said printing head in said first position when said printing head is moved along said recording surface in one direction in order to carry out printing and for maintaining said printing head in said second position when said printing head is moved in the opposition direction.

3,881,588

DEVICE FOR RE-INKING TYPEWRITER RIBBONS

Lester S. Krulwich, 241 Central Park West, New York, N.Y. 10024

Filed Dec. 10, 1973, Ser. No. 423,558
Int. Cl. B41j *31/14*
U.S. Cl. 197—171 **5 Claims**



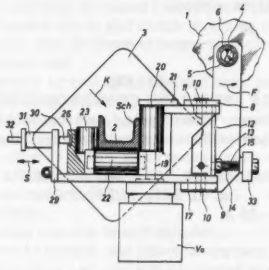
1. A device for re-inking the ribbon of a typewriter provided with ribbon spools, a center type guide and a platen movable back and forth and around comprising a resilient sheet coated on one side with a layer of pressure-releasable inking material, said sheet being sufficiently thin so as to be insertable on the platen with a portion of its ink coating behind and above the level of the center type guide and in back of the ribbon, and a pressure-applying member comprising a rotatable member detachably mounted and positioned so that said rotatable member continuously bears on the ribbon as the ribbon is reeled back and forth to and from one of said spools causing the ribbon to press on the inking surface of the said sheet thereby depositing ink on the back of the ribbon from the sheet.

3,881,589

INDEXING SYSTEM FOR SHEARS, PRESSES AND THE LIKE

Werner Peddinghaus, Bruchhausen 21, 4322 Sprockhovel-Hasslinghausen, Germany

Filed Sept. 7, 1971, Ser. No. 177,982
Claims priority, application Germany, Sept. 4, 1970, 2043868
Int. Cl. B23q *7/00*
U.S. Cl. 198—127 R **14 Claims**



1. In a machine having a frame and elements to act on a work member, a device for feeding an elongated work member predetermined distances along a path to said elements, said device including a support member extending transversely across said path, means mounting said support member on said machine frame comprising pivot means for pivotally supporting said support member on said frame, roll means supported on said support member for supporting and guiding said work member including roll means on opposite sides of said work member in which at least two spaced rolls along one side of said work member guide said work member along said path to said elements of said machine, an adjustable speed-control motor supported on said support member, drive means connecting said motor to at least one of said roll means to advance the work member a predetermined distance, and pressure operable means supported on said support member to urge the roll means on one side of said work member against the roll means on the opposite side to guide said work member along said path, said pivot means having its pivot axis spaced from said path and mounting said support member with said roll means and said pressure operable means on said machine frame for pivotal movement of said support member out of said path to allow access to said machine elements.

3,881,590

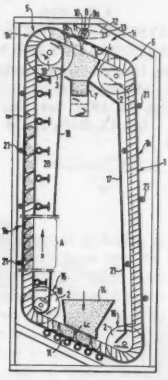
ELEVATOR CONVEYOR

Karl Hartmann, Liebrechtstrasse 37, 4130 Moers-Utfort, Germany

Filed Jan. 22, 1971, Ser. No. 191,929
Int. Cl. B65g *15/14*
U.S. Cl. 198—162 **8 Claims**

1. An elevator conveyor comprising an endless conveying belt, a plurality of driving wheels arranged in spaced relation to one another, said belt engaging said wheel so as to be movably guided thereon, partitions mounted on the interior

surface of the conveyor belt, side walls extending adjacent to marginal edges of the belt and having a substantially corrugated configuration, said partitions being mounted on said conveyor belt so as to form an acute angle with the plane defined by the conveyor belt, the ends of each of said partitions disposed contiguous to the oppositely disposed corrugated side walls without being fixedly joined thereto, said conveyor belt having its longitudinally extending marginal edges being disposed outside said side walls such that the



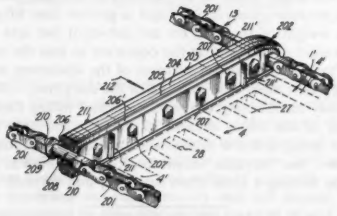
adjacent surfaces thereof operatively engage said driving wheels; the elevator conveyor further comprising a covering belt, at least two driving drums situated coaxially relative to correspondingly positioned driving wheels and being journaled separately thereof, said covering belt positioned to cover the conveyor belt and being co-movable and in engagement with the substantially corrugated side walls, whereby the conveyor is substantially closed by engagement of said covering belt with said side walls.

3,881,591

CONVEYING MEANS FOR A MOLD STRUCTURE

Juan Manuel Abalo, Buenos Aires, Argentina, assignor to Noel y Compania Limitada Sociedad Anonima Argentina de Dulces y Conservas, Buenos Aires, Argentina

Division of Ser. No. 165,065, July 22, 1971, Pat. No. 3,778,018. This application Sept. 13, 1973, Ser. No. 396,773
Int. Cl. B65g *19/24*
U.S. Cl. 198—175 **7 Claims**



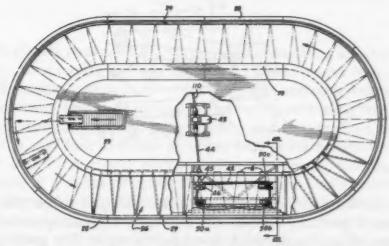
1. Endless conveyor means provided with two spaced apart, flexible drawing members passing through spaced apart carrier partitions, each of said carrier partitions consisting of at least one resilient, wearable, pressure expandable, heat insulating partition member having a front face, a rear face and a periphery, clamping members, hard front and rear backing plates positioned, with the aid of said clamping members passing through said backing plates and said resilient partition member, onto said front and rear faces, said backing plates having peripheries which remain within the periphery of said resilient member, said clamping members being length-wise adjustable to reduce the mutual distance between said backing plates, each heat insulating partition member and its hard front backing plate being shiftable along a portion of said drawing members, an abutment on each said portions adapted to enter in abutting and blocking contact with said rear backing plate, and said drawing members passing through said backing plates adjacent the peripheries thereof.

3,881,592

MODULAR BAGGAGE HANDLING SYSTEM WITH CHAIN DRIVE

Jack E. Stimpson, Plain City, Utah, assignor to Stanray Corporation, Chicago, Ill.

Continuation of Ser. No. 319,622, Dec. 29, 1972, abandoned. This application July 10, 1074, Ser. No. 487,040
Int. Cl. B65g *17/00*
U.S. Cl. 198—181 **6 Claims**



1. A modular baggage handling system comprising:

a. a continuous chain mounted in a plane having elongated links;

b. a guide rail means having substantially vertical flanges defining the configuration of said chain;

c. a plurality of load wheel assemblies each having a substantially vertical stub axle connected to one of said links, a first load carrying wheel coaxially pivotable about the axis of said stub axle, and a guide wheel rotatably mounted on said stub axle in rolling contact with said guide rail flanges;

d. a plurality of pallet carriers mounted on said links, each having a load carrying base positioned at an inclined angle and a substantially vertical flange at the extreme lower end of said base, a bracket connected to said load carrying base, and a second load carrying wheel mounted for rotation at the upper end of said pallet carrier on an elevated track;

e. said first load carrying wheel, said stub axle and said vertical flange of each of said pallet carriers being substantially in vertical alignment to insure negligible separation of said pallets in the plane of said vertical flanges;

f. drive means including at least a first drive chain member;

g. means associated with each of said pallet carriers for engaging said drive chain member, said means being adjustable relative to said each of said pallet carriers for alignment with said drive chain member, each of said means including a chain dog member independently mounted on each pallet carrier and disposed to engage a portion of said drive chain member such that movement of said drive chain member will impart corresponding movement to each pallet carrier thereby operatively engaged, such that each pallet carrier will be moved relative to said guide rail means;

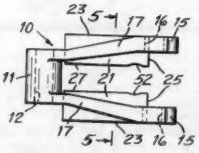
h. a continuous flexible bumper member coextensive in length with said continuous chain, connected to and substantially covering said pallet carrier flange and spanning the distance between said pallet carriers;

i. sheet plate members mounted on each of said load carrying bases providing a surface overlapping said pallet carriers and adjacent plates for providing a continuous surface for receiving baggage and other articles;
j. each of said sheet plate members carrying a resilient strip on its overlapping edge to prevent galling of the plate surfaces which come in overlapping rubbing contact; and
k. resilient means connecting said plate members to said pallet carriers to permit limited relative movement in a direction normal to the plane of said pallet base members.

3,881,593
CHAIN CONVEYOR LINK AND ATTACHMENT THEREFOR

John N. Mushovic, Simsbury, and Richard M. Bell, Lakeville, both of Conn., assignors to Norton Company, Worcester, Mass.

Filed Jan. 28, 1974, Ser. No. 437,328
Int. Cl. B65g *17/06*
U.S. Cl. 198—189 **12 Claims**



11. An array of conveyor links arranged to be interconnected pivotally each to the adjoining links at opposite ends thereof, and collectively arranged to move in a given direction,

attachment engaging means fixedly secured to at least some said conveyor links

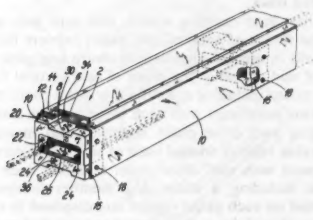
attachment means slidable into engagement with said attachment engaging means in the direction opposite to said given direction, and

stop means operative to limit movement of said attachment means relative to said attachment engaging means.

3,881,594
BELT CONVEYORS

Peder Jorgensen Jepsen, Skovparken 3, Hojen, Vejle, Denmark

Filed Dec. 21, 1972, Ser. No. 317,300
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **7 Claims**

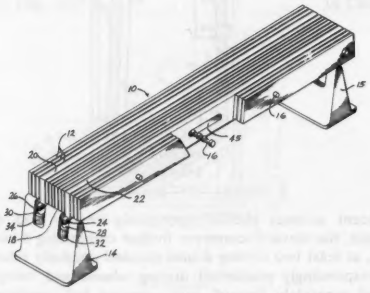


1. A belt conveyor comprising: a conveyor belt with an upper covering run and a lower run return, said runs being slidably supported on elongated carrier means of a conveyor chassis having means for holding the carrier means, said holding means including a plurality of cross wise arranged block members mounted in spaced relationship along the conveyor and having the conveyor means for the upper run of the conveyor belt mounted adjacent their topside, said block members having a central passage through which the lower return run of the conveyor belt and the carrier means thereof extend, said block members being split into block parts along a longitudinal vertical plane above and below the central passage, and means for releasably connecting said block parts to each other, wherein between two of said block parts there is mounted an intermediate block part having portions projecting to both sides of the vertical middle plane so as to form a double block member together with the outer block parts.

3,881,595
CONVEYOR SYSTEM FOR THE INTERMITTENT FORWARDING OF SAND MOLDS

Vagn Deve, Shaker Heights, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 26, 1972, Ser. No. 318,331
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 **3 Claims**



1. A method of operating a conveyor for molds wherein molds are intermittently added to one end of the conveyor, and intermittently removed from the other end thereof, said conveyor having a plurality of stationary, parallel, spaced longitudinal members having flat upper surfaces which lie in a common horizontal plane, and a movable longitudinal means positioned in internesting relationship with the stationary members having a flat upper surface which in a first position lies in the same plane as the upper surfaces of the stationary members, and which in a second position lies beneath the plane of the upper surfaces of the stationary members, both the stationary longitudinal members and the movable longitudinal means extending substantially the entire length of the conveyor, comprising the steps of initially loading the conveyor with molds from one end to the other, applying a predetermined lifting force to the bottom of the movable means, which predetermined lifting force is greater than fifty percent of the weight of the load on the conveyor but less than the total weight of the load on the conveyor so that the molds are not lifted from the upper surfaces of the stationary members, sliding a new mold onto one end of the conveyor, while simultaneously maintaining the predetermined lifting force to the bottom of the lifting means, so that the movable means is moved along with the molds, and thereafter applying a force to move the movable means back to its original position, thereby forcing a mold from the other end thereof.

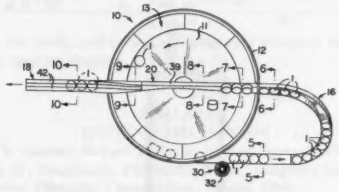
3,881,596
PARTS FEEDER

Paul Marcus Miller, Seminole, Fla., assignor to Tangen Drives, Inc., Clearwater, Fla.

Filed Oct. 15, 1973, Ser. No. 406,264
Int. Cl. B65g *47/24*
U.S. Cl. 198—276 **9 Claims**

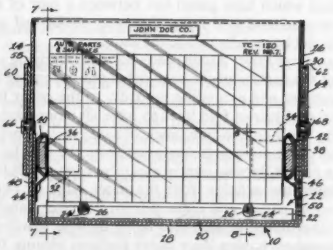
1. A feeder for small parts which oreints the same comprising, in combination,

a feeder
first orienting means interior of the feeder prior to the delivery of parts,
a delivery track in feeding communication secured to the feeder to receive parts from the first orienting means,
said delivery track being oriented upwardly and outwardly and reversedly to pass back over the feeder at a position elevated thereof,
second orienting means in direct feed communication with the delivery track over the feeder,



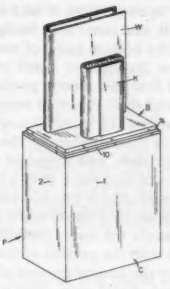
said second orienting means including reject means to discharge unoriented parts back into the feeder,
said reject means including a tilted base having a ledge in combination therewith whereby parts whose center of gravity passes over the vertical axis of the extreme portion of the ledge will be recirculated into the feeder,
and a discharge track in feed communication with the second orienting means to transport the part properly oriented for further processing.

3,881,597
PORTABLE MICROFILM HOLDER
Ernest A. Dahl, Jr., 729 Greenwood Ave., Wilmette, Ill. 60091
Filed Aug. 8, 1973, Ser. No. 386,595
Int. Cl. B65d *5/44*; **G09f** *7/10*
U.S. Cl. 206—44 B **16 Claims**



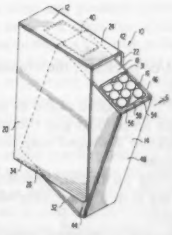
1. A readily portable holder for microfilms and the like including an elongate closure base section, a removable magnet support member superimposed over said elongate closure base section laterally spaced file card supporting rod means adjacently traversing said base section and over said removable magnet support member, a plurality of generally upright file cards traversed and supported by said rod means, magnetic means carried by opposite upright margins of said cards and located in the vicinity of the lower half of said cards, end closure sections extending upwardly from the opposite extremities of said elongate closure base section, magnets supported by said removable magnet support member adjacent said end closure sections in the vicinity of said magnetic means, the area between adjacent file cards serving to accomodate microfilms, and relatively, laterally shiftable closure sections extending upwardly from opposite elongate margins of said base section.

3,881,598
DISPLAY PACKAGE
Alan F. Schwimmer, Evanston, Ill., assignor to Amity Leather Products Company, West Bend, Wis.
Filed July 5, 1973, Ser. No. 376,420
Int. Cl. B65d *5/52, 25/24*
U.S. Cl. 206—45.2 **1 Claim**



1. A display package for an article and comprising a molded plastic cover having an open bottom, a molded plastic base of complementary shape to the cross section of said open bottom of said cover, said base having an outwardly extending flange formed integrally around its periphery and intermediate the height of said base to define an upper base portion above said flange and a lower base portion below said flange, said base also having a series of upwardly extending projections integrally formed with said base for supporting articles thereon and above said base, whereby said cover can be inserted over said articles and be supported on said flange with said upper base portion slipped snugly into said cover, said cover having an integral top and also having integral side walls which extend upwardly beyond said top to form a recessed upper end of said cover whereby said base can be set on top of said cover without reversing said cover and into said recessed upper end of said cover with said lower base portion extending into said recessed top, the base flange resting on the upper said end of said side walls of said cover for display of the articles held by said upwardly extending projection.

3,881,599
CIGARETTE DISPENSING PACKAGE
Kenneth Allen Flaherty, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Jan. 24, 1974, Ser. No. 436,024
Int. Cl. B65d *5/85*
U.S. Cl. 206—273 **19 Claims**



1. A package for cigarettes or other articles comprising:
a. an outer shell having opposed front and rear wall panels and top and bottom panels connecting said wall panels, said panels defining a pair of opposed open sides, said bottom panel having first and second portions;

b. an inner shell containing said cigarettes or other articles, said inner shell being positioned within said outer shell, said inner shell having oppposed front and rear wall panels and side panels connecting said wall panels, at least a portion of at least one of said panels extending substantially between the second portion of said bottom panel and said top panel and having an edge engageable in sliding contect with the under surface of the top panel of said outer shell upon rotation of said inner shell relative to the outer shell, said inner shell being connected to the first portion of the bottom panel of said outer shell;

c. hinge means on the bottom panel of said outer shell connecting said first and second portions of the bottom panel of said outer shell to permit swinging movement of said first portion relative to the second portion whereby the inner shell is rotatable to and from a first position within said outer shell, and a second position angularly disposed relative to said outer shell wherein a portion of the top of the inner shell is exposed lateraly of said outer shell so that articles may be removed therefrom;

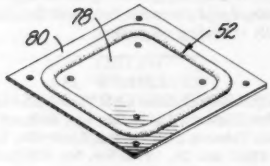
d. abutment means on the under surface of said top panel for engagement with the portion of the inner shell which extends between the second portion of the bottom panel and the top panel of said outer shell to limit the rotation of the inner shell.

3,881,600

CARPETING INSTALLATION WITH REMOVABLE ACCESS PANEL

Harvey J. Hill, Los Angeles, Calif., assignor to Roberts Consolidated Industries, Inc., City of Industry, Calif.

Division of Ser. No. 162,548, July 14, 1971. This application May 21, 1973, Ser. No. 362,389
Int. Cl. B65d *85/02*
U.S. Cl. 206—303 **3 Claims**



1. In a form and/or package, the combination of:

a. an inner card;

b. an outer card in the same plane as and surrounding said inner card with an endless gap therebetween;

c. an endless, flexible T-shaped strip having a leg and inner and outer flanges;

d. said strip having an initial, unrestrained configuration wherein said leg is in a plane extending inwardly of said strip as a whole;

e. said strip having a twisted restrained configuration wherein said leg is substantially perpendicular to the plane of said cards and is disposed in said gap, and wherein said inner and outer flanges respectively overlie said inner and outer cards; and

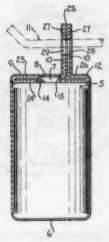
f. said cards maintaining said strip in said restrained configuration.

3,881,601

RACK DISPLAY PACKAGE FOR DRY CELLS AND THE LIKE

Richard L. Walus, and Peter S. Cartwright, both of Minneapolis, Minn., assignors to Possis Corporation, Minneapolis, Minn.

Filed Sept. 21, 1973, Ser. No. 399,528
Int. Cl. B65d *65/12, 65/16, 73/00*
U.S. Cl. 206—497 **5 Claims**



1. A package containing a group of identical cylindrical articles of merchandise, each having an upper and a lower end, said articles being visible in substantial part in said package and being confined by the package in circumferentially adjacent relationship with their upper ends coplanar, said package further comprising:

A. a substantially rectangular substrate having inner and outer surfaces, a pair of opposite side edges spaced apart by a distance such that the substrate can extend entirely across the entire group of articles at one end thereof, and opposite end edges, said substrate having fold lines extending transversely to said side edges and along which the substrate is folded to have

1. a base panel that overlies the articles at one end thereof and which base panel lies between a pair of adjacent ones of said fold lines, the outer surface of said base panel being adjacent to the articles,

2. a pair of cover panels, each flatwise overlying a portion of the surface of the base panel that is remote from the articles and extending inwardly to the other from one of said pair of fold lines to have an inner edge defined by another fold line, each of said cover panels having its outer surface facing away from the articles, and

3. a pair of flatwise contiguous tabs, each projecting away from the articles from the inner edge of one of the cover panels and defined from its cover panel by said other fold line, said tabs being flatwise adhered to one another, having their outer surfaces remote from one another, and having registering holes in which a display rack hook is receivable; and

B. a skin-like transparent film snugly embracing the group of articles and flatwise secured to substantial portions of the outer surface of the substrate to thus hold the articles assembled with one another and the substrate.

3,881,602

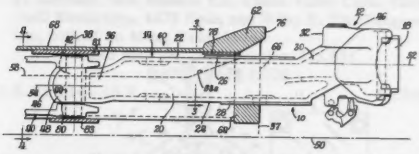
OFFSET COUPLING

Russell George Altherr, Munster, Ind., and Ralph William Holibaugh, Park Forest, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 11, 1974, Ser. No. 432,570
Int. Cl. B61g *3/00*
U.S. Cl. 213—75 R **17 Claims**

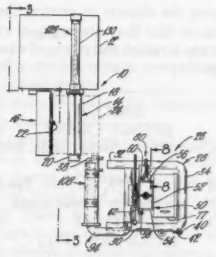
1. A railway coupler construction for use with a railway car having a horizontally oriented deck, said coupler construction comprising a head having a horizontal center line at a prede-

termined height, a shank extending from said head with a horizontal center line below that of the head and at least as



low as the deck, and means securing said shank to the car in pulling relation thereto.

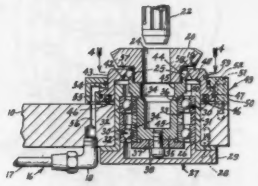
3,881,603
DOFFING MECHANISM
David V. Stotler; Robert J. Gelin, both of Newark, Ohio, and John W. Daugherty, Plymouth, Mich., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Mar. 23, 1973, Ser. No. 344,306
Int. Cl. B66c *1/54*
U.S. Cl. 214—1 D **8 Claims**



5. Apparatus for handling a heavy object having a central opening therethrough and positioned on a mandrel or the like, said apparatus comprising an elongate supporting member, resilient means on said supporting member extending thereabout and forming an annular fluid chamber, means for supplying fluid to said chamber through said supporting member, means for supporting said supporting member in a position in alignment with the mandrel and for moving said supporting member to a position spaced from said mandrel, means on an end of said supporting member for aligning said supporting member with the mandrel, positioning means adapted to be positioned in a fixed position relative to said mandrel and engageable with said supporting means for aligning said aligning means transversely with an end of the mandrel, and means for pivotally moving said supporting member between a generally horizontal position and a generally vertical position with said aligning means extending downwardly.

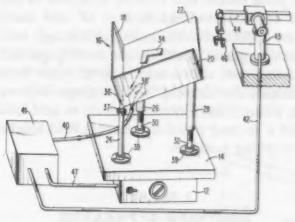
3,881,604
MACHINE LOADER PICKUP DEVICE
William Louis Eggemeier, Florence, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed May 11, 1973, Ser. No. 359,621
Int. Cl. B66c *1/48*
U.S. Cl. 214—1 BC **1 Claim**

1. In a machine loader, a pick-up device comprising:
a. an activator shaft;
b. means for supporting said shaft for rotation and axial translation;
c. an arm fixed to said shaft and extending radially therefrom;
d. a housing fixed to said arm at the end thereof remote from said shaft and movable through a predetermined path when said shaft is rotated and axially translated;
e. a plurality of balls spaced around one end of said housing and retained therein in a rotatably mounted spindle, said balls movable radially relative to a central axis through said housing parallel to said shaft;
f. a piston and cylinder in said housing, movable relative to one another along the central axis; and



g. a ring affixed to one of said piston and cylinder, whose axis is coaxial to said central axis, and wherein said ring has a conical bore, the surface of which bore acts as a wedge upon the balls to convert axial motion of said piston and cylinder into simultaneous radial motion of said balls to move said balls toward and away from said central axis.

3,881,605
OBJECT ORIENTING DEVICE TO ASSIST ROBOT MANIPULATOR
David D. Grossman, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 29, 1973, Ser. No. 375,299
Int. Cl. B65j *3/00*
U.S. Cl. 214—1 CM **6 Claims**



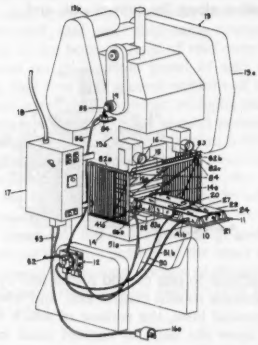
1. An object orienting and position sensing device for orienting an object in one of a plurality of stable positions and sensing which of the positions the object is oriented in comprising a box having at least two sides and a base intersecting at a common point, supporting means mounting said box with said base tilted at a dihedral angle relative to the horizontal with said common point disposed lowermost, means for vibrating said box whereby an object is oriented into one of a small number of possible stable positions and sensing means associated with said box to sense the final oriented position of an object upon a base adjacent said common point whereby the actual orientation is uniquely indentified, said object having a shape such that in its final position said object contacts said bottom and said two sides resulting from said object being conveyed into the corner region defined by the intersection of said bottom and said side walls, further said object having a geometric shape capable of having a plurality of final stable positions which can be uniquely indentified relative to any other final stable position by said sensing means.

3,881,606

SLIDING NEST FEEDING APPARATUS

Ross P. Swinehart, Oregon, Wis., assignor to Wisco Industries, Inc., Oregon, Wis.

Filed Aug. 22, 1973, Ser. No. 390,578
Int. Cl. B26d *7/06;* **B65g** *47/76;* **B21d** *43/20*
U.S. Cl. 214—1 BB **7 Claims**



1. Feeding appartus for engaging a locating nest which horizontally locates a workpiece in a working position within the work area of a press, and for transferring the locating nest between the working position and a loading position remote from said work area, said feeding apparatus comprising:

a. a frame attachable to said press;

b. support plate means attached to the upper side of said frame for slidably supporting a workpiece within said locating nest between said loading position and said work area, said support plate means having a longitudinal slot therein;

c. at least one longitudinally extending support member mounted to said frame beneath said support plate means;

d. a carriage having a lower portion located beneath said support plate means and slidably attached to said support member for longitudinal motion of said carriage, and having an upper portion extending through said slot and above said support plate means to engage and support said locating nest above said support plate means; and

e. drive means for driving said carriage between a first position wherein said locating nest is in said loading position, and a second position wherein said locating nest is in said working position.

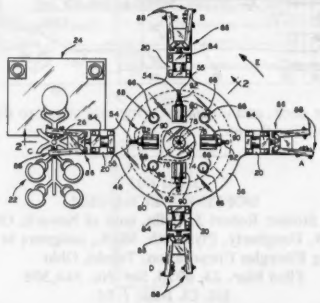
3,881,607

TRANSFER APPARATUS

Dong Sing Lewis, Toledo, Ohio, assignor to Gerity-Schultz Corporation, Toledo, Ohio

Continuation of Ser. No. 202,208, Nov. 26, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,398
Int. Cl. B66c *1/66*
U.S. Cl. 214—1 BC **11 Claims**

1. Apparatus for transferring objects between stations comprising: a plurality of equally spaced radially extending arms, an indexing table interconnecting said arms within a common plane and having at least one aperture formed therein, a rotating table, means for rotating said rotating table, column means attached to said rotating table and extending through said aperture in said indexing table for interconnecting said rotating table and said indexing table to impart simultaneous unidirectional rotational motion thereto and to permit relative movement between said tables in a direction normal to the axis of rotation thereof, means for elevating said indexing table extending through said rotating means, rotation preventing means coacting with said index table and arranged so as to permt rotation of said indexing table only in the elevated position, means for engaging the objects connected to said arms for supporting the objects during transfer between stations, and means positioned in the path of movement of said



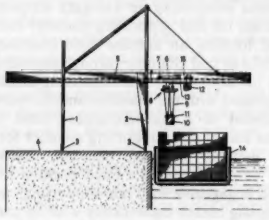
means for engaging the objects to control the means for engaging the objects so that they are engaged at all times when said elevating means is raised and released when said elevating means is lowered.

3,881,608

BRIDGE CRANE

Leonard Hupkes, Heemstede, Netherlands, assignor to Conrad-Stark B.V.

Filed Aug. 6, 1973, Ser. No. 386,096
Claims priority, application Netherlands, Aug. 17, 1972, 7211277; Aug. 17, 1972, 7211280
Int. Cl. B63b *27/12*
U.S. Cl. 214—14 **10 Claims**



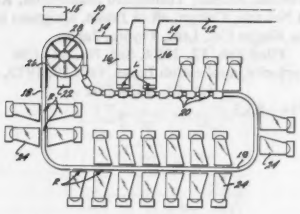
1. A bridge crane for loading and unloading containers or packing crates into and from a vessel, said crane comprising a support structure including a horizontal girder, at least one carriage supported for movement along said girder, hoisting means on said carriage for raising and lowering a load from and into a vessel therebelow, propelling means for advancing the carriage along said girder, a positioning member supported for movement along said girder independently of said carriage and including optical sighting means on said positioning member for determining the position of the positioning member along the girder with respect to the vessel therebelow, and means operatively associated with said carriage and said positioning member for halting the carriage at a predetermined distance from said positioning member.

3,881,609

TILTABLE TRAY SORTING SYSTEM WITH ADJUSTABLE DRIVE MEANS

Peter H. Ellis, 545 Parkway, Chula Vista, Calif. 92010; Allen F. Eastham, 688 Mission Ct., Chula Vista, Calif. 92012; Cecil Bainbridge, 4475 Dale, and Wiley F. Yip, Tangoerod Ln., both of La Mesa, Calif. 92041

Filed May 28, 1974, Ser. No. 473,835
Int. Cl. B65g *43/00*
U.S. Cl. 214—11 R 9 Claims



1. A commodity sorting system comprising:

a closed loop chain means,

a closed loop track following the same path as that of said closed loop chain means,

a plurality of carriages riding on said closed loop track and having means connecting said carriages to said closed loop chain means whereby travel of said chain means about its loop causes said carriages to travel around said closed loop track, said carriages each having a tray mounted thereon and having means to allow said trays to be laterally tiltable in either direction,

a first vertical drive shaft, means for driving said chain means about its loop comprising a sprocket gear horizontally oriented on said first vertical drive shaft, first skid means, bearing means, said first vertical drive shaft being rotatably supported in said bearing means that are in turn fixedly supported above said first skid means, a motor, gear drive means, second skid means slidably mounted on said first skid means, said motor being coupled to said gear drive means, means mounting said gear drive means on said second skid, a second vertical drive shaft extending upwardly from said gear drive means in axial alignment with said first vertical drive shaft and coupling means to secure the two vertical shafts together to transmit torque from said motor to said first vertical drive shaft,

base means having sliding pads upon which said first skid means is mounted, said base means having means to adjust the tension in said closed loop chain means,

at least one loading station and a plurality of discharge stations,

carriage tip-up means positioned at each discharge station,

code entry unit means into which destination discharge station code indicia from each commodity package is inserted just prior to its being loaded onto one of said carriage trays at said loading station,

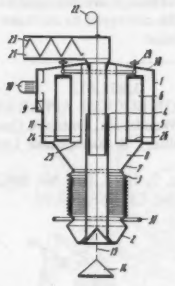
central control unit means for receiving the information fed into the code entry unit means to establish a memory circuit to control the discharge of the commodity package at a destination discharge station by sending an electrical signal to said carriage tip-up means positioned at said discharge station causing it to be actuated as the carriage tray approaches the destination discharge station.

3,881,610

LOADING APPARATUS OR LOADING HEAD FOR LOOSE MATERIAL

Heinz Wilhelm Hessling, Oststr. 41, 472 Beckum, Germany

Filed May 8, 1973, Ser. No. 358,409
Claims priority, application Germany, May 16, 1972, 7218354
Int. Cl. A01f *25/00*
U.S. Cl. 214—17 B 8 Claims



1. A loading head apparatus for charging loose material having dust or fine material associated therewith comprising a vertically extending tube means of adjustable length having an upper inlet end for receiving the loose material and lower discharge end for discharging the loose material,

container means about said tube means providing an air flow path for air and airborne dust therethrough and adjustable with said tube means,

means on said head apparatus for creating a suction to cause air and the airborne dust to flow through said container means

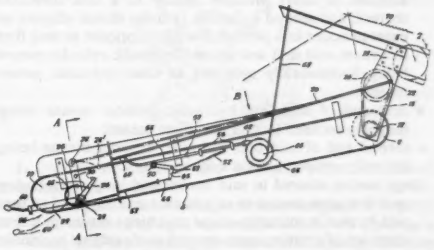
and a dust collection means within said head apparatus for separating the dust from the air and for collecting the dust.

3,881,611

LOADING APPARATUS

Thomas Henry Milbourn, Walby Cottage, Crosby-on-Eden, Carlisle, Cumberland, England

Filed Aug. 29, 1973, Ser. No. 392,452
Int. Cl. A01f *25/00*
U.S. Cl. 214—17 CA 8 Claims



1. In a loading apparatus comprising an endless conveyor having a receiving end and a delivery end, said conveyor being drivable to transfer articles loaded onto the receiving end along the conveyor for delivery to a pile of said articles positioned below said delivery end, said conveyor carrying probe means pivotally mounted thereon adapted to sense the location of said pile and control means operatively connected to said probe means and adapted to raise the delivery end of said conveyor in response to the location of articles in said pile relative to said probe means, the improvement which com-

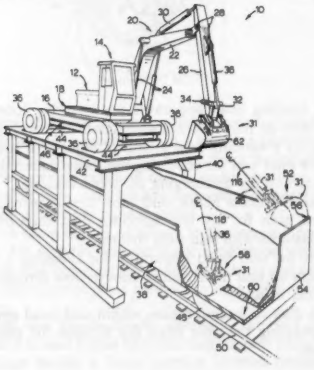
prises connecting rod means reciprocable concurrently with the movement of said conveyor, said connecting rod means being operatively connected to said probe means and adapted to continuously pivot said probe means cyclically upwardly and downwardly through a substantially vertical arc to thereby continuously monitor the distance between the top of the pile of articles and the delivery end of the conveyor, and link means interconnecting said probe and control means in such manner that, once said distance decreases to a pre-set minimum value, the control means are actuated to raise said probe and delivery end of the conveyor to increase said distance to a pre-set maximum value.

3,881,612

BACKHOE BUCKET APPARATUS

William John Wells, Woodstock, Ontario, Canada, assignor to A. E. Joslin Machinery & Equipment Limited, Arnprior, Canada

Filed Aug. 7, 1973, Ser. No. 386,392
Int. Cl. B65g 67/26
U.S. Cl. 214—44 A 10 Claims



1. In a bucket apparatus for a backhoe and similar apparatus, including a bucket, bucket attachment means and hydraulic power means, the improvement comprising:

first plate means secured to said bucket attachment means;

first hydraulic cylinder means having piston rod means adapted to exert pressure axially in a first direction thereof, and second hydraulic cylinder means adapted to exert pressure in a second direction opposite to said first direction; said first and second hydraulic cylinder means being hydraulically attached to said hydraulic power means;

a first end of said first hydraulic cylinder means being hingedly secured to said first plate means;

a second end of said first hydraulic cylinder means being hingedly secured to said bucket;

hinge means secured to said bucket and hingedly securing said first plate means to said bucket and disposed so that said bucket is rotatable about said hinge means in a first direction of rotation upon operation of said first hydraulic cylinder means, and in a second direction of rotation upon operation of said second hydraulic cylinder means; and

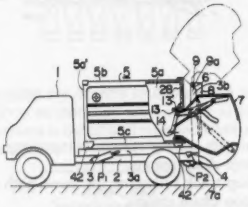
second plate means interposed between said first plate means and said bucket attachment means and substantially parallel to said first plate means; bearing means secured to said first plate means and adapted to accommodate said second plate means at its outer edges; shaft means disposed with respect to said first and second plate means and adapted with said bearing means secured to said first plate means to permit rotation of said first plate means relative to said second plate means about the axis of said shaft; third and fourth hydraulic cylinder means hingedly secured at a first end of each to said first plate means and at a second end of each to said bucket attachment means and disposed so that said first plate means is rotatable about the axis of said shaft in a first direction of rotation upon operation of said third hydraulic cylinder means, and in a second direction of rotation upon operation of said fourth hydraulic cylinder means.

3,881,613

REFUSE COLLECTION VEHICLE

Hideo Torimoto, Akashi; Yoshimitsu Shibayama, Kariya, and Takashi Nakano, Chiryu, all of Japan, assignors to Kyokuto Kaihatsu Kogyo Co., Ltd., Toyota, Japan

Filed Feb. 12, 1974, Ser. No. 441,896
Claims priority, application Japan, Feb. 19, 1973, 48-20538
Int. Cl. B65f 3/02
U.S. Cl. 214—83.3 14 Claims

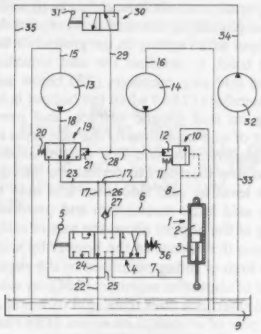


1. A refuse collection vehicle of a rear loading type which generally comprises a dumper frame mounted on the rear of a vehicle chassis, a container of a box shape for packing refuse therein to be interchangeably mounted on said dumper frame and having a refuse receiving opening at the rear thereof, means for locking said container on said dumper frame, a small door provided on said refuse receiving opening for selectively opening or closing the latter and having a sufficient size to cover said refuse receiving opening, means for driving said small door between opened and closed positions, a tailgate loading hopper of a box shape formed with a discharge opening of a corresponding size to said refuse receiving opening and a rear opening opposed to said discharge opening, and supported at the rear of said container for pivotal movement, means for swinging said tailgate loading hopper between raised and lowered positions, said swinging means for said tailgate loading hopper in turn actuating said driving means for said small door which is provided between the rear of said container and the front of said tailgate loading hopper so that said small door is closed when said tailgate loading hopper is in said raised position and the former is opened when the latter is in said lowered position, said discharge opening being adapted to face said refuse receiving opening so as to bring the former in communication with the latter when said tailgate loading hopper is in said lowered position, a packer plate housed in said tailgate loading hopper for forcing refuse dumped in said rear opening into said container through said discharge opening, and means for driving said packer plate for pushing said refuse between a rear position close to said rear opening and a foremost position sufficiently deep in said container through said discharge opening when said refuse receiving opening is in communication with said discharge opening in said lowered position of said tailgate loading hopper.

3,881,614
RECEIVERS IN PUBLIC WORKS MACHINES

Rene F. Jacob, Le Plessis-Belleville, and Pierre C. Fillion, Nanteuil-le-Haudouin, both of France, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 14, 1974, Ser. No. 432,880
Claims priority, application France, Jan. 25, 1973, 73.02665
Int. Cl. E02f 3/28
U.S. Cl. 214—138 2 Claims



1. A device for supplying a receiver with pressurised fluid, constituted by: a fluid receiver, at least two sources of pressurised fluid, a selector device having at least two positions, which is interposed between at least one of the fluid sources and the receiver and by means of which this receiver is connected, in a first position of the selection device, only to one of said fluid sources, and in a second position, to at least two of these fluid sources, and an adjusted discharge valve connected in shunt to the supply conduit of the receiver, wherein this discharge valve is provided with a device for regulating its adjustment in the course of operation having at least two pre-adjustments, and the selection device and adjustment regulating device are coupled to a common control device with two positions one of which corresponds to the communication of the receiver with only one of said fluid sources and to the selection of a determined adjustment pressure, and the other to the communication of the receiver with at least two fluid sources and to the selection of another adjustment pressure of value lower than that of the determined adjustment pressure.

3,881,615
TREE STABILIZER FOR TREE HARVESTING APPARATUS

Alva Z. Albright, 2909 Monroe Hwy., Pineville, La. 71360

Filed June 12, 1973, Ser. No. 369,364
Int. Cl. A01g 23/08
U.S. Cl. 214—147 G 1 Claim

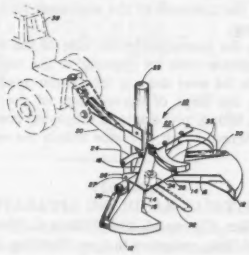
1. A tree stabilizer for a tree harvester having opposing openable and closable clamping jaws, with double edges secured by an attaching boom to a power train having an hydraulic power supply, said stabilizer comprising:

a. box column means having oppositely disposed ends, pivotally connected at one said end to said clamping jaws, said box column means being adapted for pivotally tilting, on a horizontal axis of tilt, with respect to said attaching boom:

b. an hydraulic cylinder, having a piston rod, and pivotaly attached to said attaching boom;

c. an articulated two part linkage having one part pivotally attached by an end to the attaching boom below the pivotal attachment of said hydraulic cylinder, and joined at its other end to one end of the other part and to said piston rod, and the other end of the other part being connected to said box column between the horizontal pivot axis of tilt and said clamping jaws for swinging said clamping jaws and attached box column on both sides of said horizontal pivot axis of tilt without reversing direction of travel of said piston rod;

d. grappling means, having opposing arms openable and closable coaxially with said clamping jaws, mounted on the other of said oppositely disposed ends of the box column and tilting therewith; and

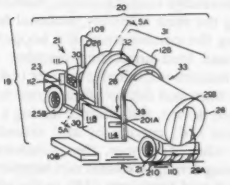


e. Sequence valve means operable connected between said hydraulic power means and said clamping jaws and grappling means and adapted to close said clamping jaws before closing said grappling means for initially securing the harvester to a tree at its most inflexible part, and adapted to open said clamping jaws before opening said grappling means for holding a tree on center while the lower jaws, embedded in the butt, are pulled free.

3,881,616
PROCESS OF REFUSE CONTAINER EMPTYING

Clyde A. Blakeley, and Joe M. Morgan, both of Lubbock, Tex., assignors to Fabit Corporation, Lubbock, Tex.

Division of Ser. No. 308,157, Nov. 20, 1972, Pat. No. 3,773,197. This application Nov. 9, 1973, Ser. No. 414,248
Int. Cl. B65f 3/02
U.S. Cl. 214—152 7 Claims



1. Process of handling and emptying refuse containers, comprising the steps of

a. locating the side of a longitudinally elongated receptacle on a vehicle having a receptacle with a top opening to bring said top opening abreast of a container, said container spaced laterally from said vehicle and with a content of refuse; said container having a top opening and a bottom spaced away therefrom;

b. moving a rigid frame and a container engaging arm thereof laterally from the vehicle and extending the container engaging arm from a traveling position to a container engaging position;

c. moving the container engaging arm into engagement with the container and supporting the container on said arm;

d. lifting the frame and container in a substantially vertical direction by guiding said frame on a substantially

vertical portion of guide tracks and moving said frame and the container thereon centrally toward the vehicle;

e. opening a lid to the receptacle top opening while lifting the frame and the container;

f. pivoting the container and frame in a direction lateral of the receptacle by guiding the frame on a curved portion of the guide tracks so that the container and frame pass centrally over the top of the receptacle and are located adjacent the opening in the top of the receptacle;

g. further pivoting the frame and container relative to the guide tracks and thus moving the top of the container downward as the said bottom of the container is moved upward and above the said container top opening and emptying the contents of the container into the receptacle opening;

h. returning the container to the side of the vehicle in upright condition with its opening at the top thereof and closing the lid over the top receptacle opening; and

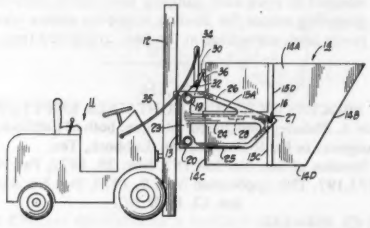
i. including the steps of surveillance of the operation of engaging, lifting, pivoting and emptying concurrent with control thereof by an operator within the vehicle.

3,881,617

MATERIAL HANDLING APPARATUS

William T. Miller, Cleveland, and William G. Morgan, Brecksville, both of Ohio, assignors to Apex Welding, Incorporated, Bedford, Ohio

Filed Apr. 2, 1973, Ser. No. 346,842
Int. Cl. B65g *65/34*
U.S. Cl. 214—315 **6 Claims**



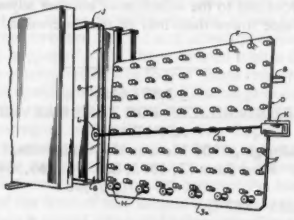
1. For use with an industrial lift truck having a mast assembly having an elevatable load-supporting member movable up and down along the mast assembly, material handling equipment comprising the combination of a hopper-lifting device attachable to said load-supporting member to be carried thereby, and a material-containable hopper (**14**) attachable to and detachable from said device and adapted to be raised and lowered with said device, said hopper having a pair of axially aligned trunnions (**16**) carried by and extending outwardly from opposite sides of hopper, the trunnions and hopper-lifting device being arranged so that said hopper tilts forwardly about the axis of said trunnions (**16**) in the absence of constraint, said hopper also having a first pair of abutment members (**15A**) carried by and extending outwardly from said opposite sides of said hopper at locations spaced rearwardly of said trunnions upon the hopper being in upright position and a second pair of abutment members (**15C**) extending outwardly from opposite sides of said hopper at locations downwardly of said trunnions upon the hopper being in upright position, said device having a transverse cross-member attached to said load-supporting member and having a pair of spaced side arms carried by said cross-member and extending forwardly thereof, each of said side arms adjacent the forward free end thereof having an upwardly opening recess (**27**), said recesses (**27**) being in axial alignment and being arranged to accommodate said trunnions (**16**) therein and to permit said hopper to rotatably tilt about the axis of said trunnions accommodated in the said recesses, respectively, and a stop member (**28**) carried by each said side arms at a location spaced rearwardly from the recess at the forward free end thereof, said stop members (**28**) being disposed to extend toward each other to engage said first pair of abutment members (**15A**) on the opposite sides of the hopper at said spaced locations upon said hopper being in upright position and to engage said second pair of abutment members (**15C**) upon said hopper being tipped forwardly from said upright position, and a latch mechanism having a first engaging part (**30**) carried by said hopper-lifting device and a second engaging part (**36**) carried by said hopper to selectably hold the hopper against tipping upon inter-engagement of said parts and to selectably release the hopper to permit it to tilt forwardly about said axis, the said arrangement permitting the side arms of said device to straddle said hopper when setting on the ground surface traversable by said lift truck to position the said trunnions above said recesses and said stop members (**28**) below said first pair of abutment members (**15A**) when the hopper is in upright position setting on said ground surface, and providing for the engagement of said trunnions by the side arms in said recesses and the engagement of said first pair of abutment members (**28**) by said stop members to permit the raising of the hopper to a higher level by said side arms and held in said upright position by said latch mechanism and providing for the forward tilting of the hopper about the axis of said trunnions and recesses upon the release of the hopper by said latch mechanism to the limit of tilting permitted by the engagement of said second pair of abutment members (**15C**) by said stop member (**28**), radial reference lines from said trunnion axis to the first mentioned pair of abutment members (**15A**) and radial reference lines from said trunnion axis to said second pair of abutment members (**15C**) being generally normal to each other, said second pair of abutment members (**15C**) being disposed to engage said stop members (**28**) upon the forward tilting of the hopper to limit the extent of said tilting to approximately a right angle.

3,881,618

PORTABLE, ONE MAN OPERATED, LARGE SHEET GLASS CUTTING TABLE

Russell W. Tausheck, Hayward, Calif., assignor to Ace Glass Co., Hayward, Calif.

Filed Nov. 15, 1972, Ser. No. 306,720
Int. Cl. B26d *3/08*
U.S. Cl. 214—505 **5 Claims**



1. A portable table top for receiving flat sheet material, comprising:

a. a portable frame;

b. a table top pivotally carried by said frame;

c. means for swinging said table top from a horizontal position into an upwardly slightly inclined position from a vertical plane;

d. a row of flat sheet supporting rollers arranged near the lower edge of said table top when the latter is in a raised position;

e. a winch mounted at one side of said table top and having a cable with a vacuum cup attached to the free end of said cable and being attachable to a flat sheet of material for

moving the sheet edgewise in the direction of its plane when said winch is operated;

f. whereby the cable from said winch can be stretched across the front of the upwardly inclined table top and the vacuum cup attached to a flat sheet of material and then the winch can be operated for causing the cable and vacuum cup to pull the flat sheet edgewise onto the table top, the lower edge of the flat sheet riding on the rollers;

g. a plurality of rotatable balls removably mounted on the table top and are spaced the same distance from the table top surface so as to support the flat sheet material a predetermined distance from the table top surface;

h. each ball being rotatably mounted in a cup that has a threaded shank removably received in a threaded bore provided in the table top, the cup being enclosed in a rubber sleeve.

3,881,619

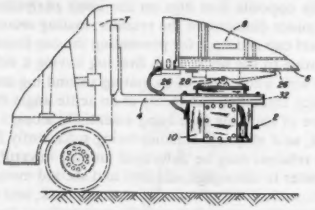
FIFTH WHEEL DEVICE

Wallace T. Morris, 35264 Grover Rd., Eastlake, Ohio 44094

Filed Sept. 27, 1973, Ser. No. 401,389

Int. Cl. B66f *9/12;* **B62d** *53/08*

U.S. Cl. 214—620 **15 Claims**



1. A portable, self-contained fifth wheel device for detachable mounting on a vehicle, such as a fork lift truck or the like, for towing a wheeled container, such as a trailer, comprising, a frame for detachable connection on a wheeled vehicle of the type having at least one support arm,

said frame including a pivotally mounted fifth wheel for detachable connection to a wheeled container,

said frame having at least one interlocking means including a hollow housing for receiving said support arm,

said housing including a fluid actuated lock means for selective locking engagement with said support arm,

said fluid actuated lock means includes a brake member supported by said frame for movement within said housing, and

fluid power means operatively connected to said lock means for selectively moving said brake member into engagement with said support arm within said housing for clamping said support arm to said frame to enable said wheeled container to be connected to said fifth wheel and supportably mounted on said vehicle.

3,881,620

BUMPER, CABLE AND/OR GRAPPLE TYPE PULPWOOD HANDLING MACHINE

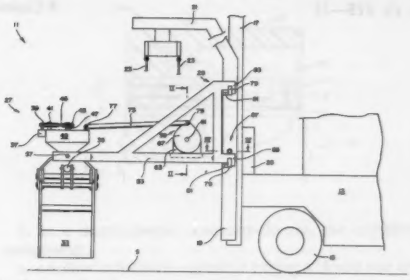
Evo Walker, Louisville, Miss., assignor to Taylor Machine Works, Louisville, Miss.

Filed July 12, 1972, Ser. No. 271,627

Int. Cl. B66f *9/06*

U.S. Cl. 214—620 **9 Claims**

1. An improvement in a bumper and cable type pulpwood handling machine having a platelike bumper for engaging and aligning one of the ends of several pieces of pulpwood, and cable means attached to said bumper for circumscribing and slingably supporting s plurality of pieces of the pulpwood; wherein said improvement comprises a grapple which may selectively be used in lieu of said cable for alternately taking hold of and supporting the plurality of pieces of pulpwood said grapple including jaws for engaging the pulpwood, means for operatively opening and closing said jaws; and means for facilitating rapid attachment and detachment of said grapple



to and from said bumper including a plurality of grapple support members protruding outwardly from said bumper and being fixedly attached thereto, and a plurality of downwardly directed hook means fixedly attached to said grapple, said hook means being positioned on said grapple for respective cooperation with said grapple support members.

3,881,621

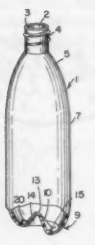
PLASTIC CONTAINER WITH NONEVERTING BOTTOM

Domas Adomaitis, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 2, 1973, Ser. No. 375,310

Int. Cl. B65d *23/00*

U.S. Cl. 215—1 C **10 Claims**



1. In a generally cylindrical thermoplastic container biaxially oriented, at least in the generally cylindrical section, the improvement wherein the bottom configuration comprises essentially of a series of connected geometrical curves rotationally symmetrical about the center line of the bottle comprising:

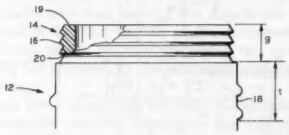
a truncated hemispherical section at the lower end of said bottom;

an inwardly concaved bottom section within said hemispherical section having an upwardly directed apex and a base adjacent to the lower end of said hemispherical section;

an arcuate toroidal juncture section between the base and the lower edge of said hemispherical section; and

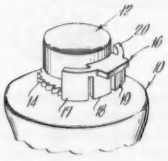
a strength-imparting thick annulus located at and integrated with said juncture section and thicker than said sections.

3,881,622
GRIPPING END OF PARISON TO FORM BOTTLE HAVING PLURALITY OF GROOVES AT NECK END
Calvin D. Dockery, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 20, 1973, Ser. No. 389,735
Int. Cl. B65d *1/02*
U.S. Cl. 215—31 **5 Claims**



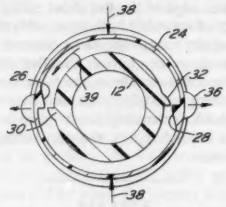
1. A biaxially oriented hollow article of a thermoplastic polymer having a neck portion comprising a smooth top surface, a thread section, and a plurality of annular ridges around the outside of said neck between said top surface and said thread section, a furthermost radial extension of grooves between said ridges being less than a furthermost radial extension of furrows between threads of said thread section.

3,881,623
SAFETY CLOSURE DEVICE
William James Landen, 30 Fairwood Dr., Cheshire, Conn. 06410
Filed May 24, 1974, Ser. No. 473,179
Int. Cl. B65d *55/02, 85/56;* A61j *1/00*
U.S. Cl. 215—216 **9 Claims**



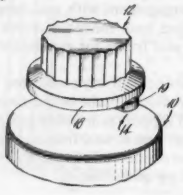
1. In combination, a bottle or the like having a body with an externally threaded neck, and a safety cap with a body having a threaded bore to removably engage said neck, said neck having beneath said threads a circumferentially extending plurality of spaced ratchet serrations, and said cap including a radially outwardly extending tab having compliant integral connection to said body; the underside of said tab including a plurality of angularly spaced finger elements having independent compliant integral connection to said tab at locations radially offset from said cap body, and an arcuate succession of ratchet-tooth formations on said finger elements and positioned for compliant ratcheting interference with said neck serrations in approach to and at the location of fully threaded cap-to-neck engagement, whereby plural independent ratchet-lock relationships are obtained for the fully engaged position and yet a single deflection of said tab against the compliance of its connection to the cap body will disengage all ratchet-lock relationships, to permit cap-unthreading from said neck.

3,881,624
TAMPERPROOF CONTAINER
Frank E. Dougherty, Sr., Mays Landing, N.J., assignor to Dougherty Brothers Company, Buena, N.J.
Filed Jan. 31, 1974, Ser. No. 438,327
Int. Cl. B65d *55/02, 85/56;* A61j *1/00*
U.S. Cl. 215—221 **11 Claims**



1. An article of manufacture comprising a container having a neck at one end thereof, said neck having an opening, a cap connected to threads on said neck, an elliptical retainer on one of said cap and neck below said threads, the minor diameter of said retainer being greater than the diameter of said cap, diametrically opposite first lugs on the inner peripheral surface of the minor diameter of the retainer, mating second lugs on one of said cap and neck for preventing the cap from being rotated relative to the neck, each first lug having a side face engageable with a side face of its mating second lug and with a cam surface extending outwardly at an acute angle thereto, the side face of each lug face lying essentially along a radius of the neck, said elliptical retainer being sufficiently flexible so that the retainer may be deformed radially inwardly at its major diameter to disengage said first and second mating lugs and permit rotation of the cap relative to the neck, and at least one rigid projection extending radially outwardly at the minor diameter on said retainer adjacent one of said first lugs on the retainer, whereby said projection appears to be the means for manipulating a separation of said lugs but is incapable of doing so.

3,881,625
RATCHET-TYPE SAFETY CLOSURE
William James Landen, 30 Fairwood Dr., Cheshire, Conn. 06410
Filed July 2, 1974, Ser. No. 485,104
Int. Cl. B65d *55/02, 85/56;* A61j *1/00*
U.S. Cl. 215—221 **10 Claims**



1. In combination, a bottle or the like having a body with an externally threaded neck, and a safety cap with a body having a threaded bore to removably engage said neck, the open end of said cap body having a counterbore comprising a circumferential succession of downwardly exposed axially undulating ratchet-tooth formations within a circumferentially continuous skirt, and said neck being integrally formed with two axially compliant radially outward ratchet wing members at diametrically opposed locations beneath and adjacent the open end of said cap body when the neck is closed by said cap, each wing member extending radially outward of said skirt for manual access and comprising a substantially flat element having a transverse section that is substantially greater in

width than in thickness, each wing member being continuously formed with said neck in such orientation that the width dimension of the wing member extends over an arc about the neck axis, whereby axially compliant flexure of the cantilevered outer end of each wing member is the favored mode of wing-member deflection, an upwardly projecting ratchet tooth integrally formed with the upper surface of each wing member at the location of radial registry with ratchet-tooth formations of said cap, the axial extent of upward projection of said ratchet teeth being less than the axial depth of said ratchet-tooth formations, whereby for each ratcheted engagement the associated wing member is stabilized by relatively extensive continuous arcuate contact with said skirt, thus preventing bottoming contact of the ratchet tooth in any of the ratchet-tooth formations of said cap.

3,881,626

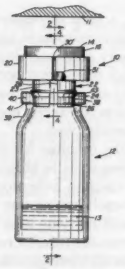
CONTAINER CLOSURE FOR LYOPHILIZED PRODUCTS

Ralph A. Bartell, Convent Station, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 308,096, Nov. 20, 1972, Pat. No. 3,834,571. This application June 5, 1974, Ser. No. 476,509

Int. Cl. B65d *51/16*

U.S. Cl. 215—256 **6 Claims**



1. An integrally formed closure for a lyophilized product container; wherein said container comprises a neck, an upwardly facing circular opening in said neck and an external radial bead on said neck, said opening having a predetermined diameter; said closure comprising:

a top wall portion;

a stopper portion extending downwardly from said top wall portion;

said stopper portion comprising an upper cylindrical section having an outer diameter greater than said predetermined diameter, a bottom cylindrical section having an outer diameter less than said predetermined diameter, an annular beveled section interconnecting said upper and bottom sections, and port means for venting said container during a lyophilization process;

said beveled section having an upper outer diameter greater than the outer diameter of said upper cylindrical section and providing means for seating said closure in a first position in said neck during the lyophilization process with said port means positioned at least in part above said opening; and

a tear-away skirt portion extending downwardly from said top wall portion, and including means for engaging said bead when said closure is seated in a second position in said neck with said port means positioned below said opening to prevent venting said container.

3,881,627

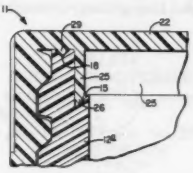
VIAL CONTAINER AND CLOSURE

Ronald L. Davolt, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed May 9, 1973, Ser. No. 358,481

Int. Cl. B65d *41/04*

U.S. Cl. 215—329 **8 Claims**



1. In a thermoplastic container-closure, the combination comprising:

a. a hollow cylindrical container having a closed end and an open end having a lip thereon, said open end providing

i. threads on its outer surface, and

ii. a cylindrical counterbore on the inner wall thereof extending downwardly from said lip and terminating in an upwardly inclined, inwardly projecting, inner shoulder;

b. an annular closure having a top wall, an outer, integral, depending skirt attached to said top wall, said outer skirt providing threads on its inner surface, an inner, integral, depending cylindrical skirt attached to said top wall, said inner cylindrical skirt being in sealing engagement with said cylindrical counterbore and the lower end of said inner skirt being seated against said inner shoulder when said closure is threadedly attached to said container.

3,881,628

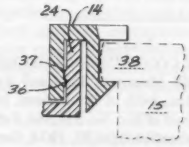
AEROSOL CAN HOLDER

Andrew W. Brainerd; Kent H. Brainerd, and Stuart W. Brainerd, all c/o 1 N. Lasalle St., Winnetka, Ill. 60602

Division of Ser. No. 129,006, March 29, 1971, Pat. No. 3,722,021, which is a continuation-in-part of Ser. No. 39,275, May 21, 1970, abandoned. This application Mar. 21, 1973, Ser. No. 343,544

Int. Cl. B65d *83/14*

U.S. Cl. 220—17 **6 Claims**



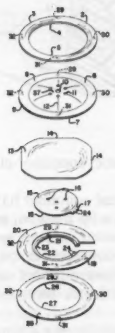
1. An elongate housing device designed to receive an aerosol can or the like, said housing device having at least one open end defined by an axially extending neck portion, permitting an aerosol can to be disposed therein, and means for retaining an aerosol can body in said housing, said means including a ring member capable of being mounted on an upper region of a can body and including means for attachment to said neck portion, which comprises axially extending wall means formed on said ring and having an effective inner diameter greater than the outer diameter of said neck portion, protrusion means on the inner surface of said wall means and corresponding protrusion means on the axial outer surface of said neck portion over which said protrusio means on said outer wall means are engaged in a snap-fit relation thereby retaining said ring on said neck portion.

3,881,629

SELF-ALIGNING RUPTURE DISC

Kenneth R. Shaw, Kansas City, and Franlkin A. Hansen, Raytown, both of Mo., assignors to Continental Disc Corporation, Riverside, Mo.

Filed Sept. 4, 1973, Ser. No. 393,736
Int. Cl. B65d *25/00*
U.S. Cl. 220—89 A 9 Claims



1. In a self-aligning rupture disc assembly adapted to block a flow passageway and having an inlet flange having an inlet passageway, an outlet flange, a pressure relief disc having an inlet surface and an outlet surface, said relief disc being sealed at said outlet surface with respect to said outlet flange, and a perforated vacuum support disc, the improvement comprising:

a. A support disc mounting ring having an outer flange portion sealed with respect to said relief disc inlet surface and an inner centering sleeve portion extending axially of said flange portion and away from said relief disc,

b. said sleeve portion being of lesser outside diameter than said inlet passageway and received thereinto, and

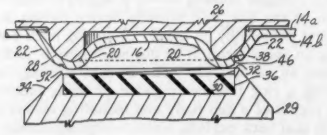
c. a ledge projecting inwardly from said sleeve portion forming therewith a depressed seat receiving said vacuum support disc.

3,881,630

POP-IN CONTAINER CLOSURE

Walter C. Lovell, 348 Mountain Rd., and Frederick G. J. Grise, 12 Maiden Ln., both of Wilbraham, Mass. 01095

Continuation-in-part of Ser. No. 331,844, Feb. 12, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 463,056
Int. Cl. B65d *41/32*
U.S. Cl. 220—268 16 Claims



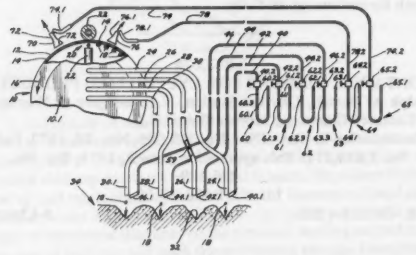
1. A manually disruptable pop-in type of button closure for a planar metal container lid comprising an integral button having inner and outer merging bounding walls generally inclined to the plane of the lid, one of the walls having opposite sides and being longitudinally indented on one side to provide a fracture extending between the bottom of the indentation and the other side of the one wall, and a face of the indentation being dilated relative to the fracture to permit its disruption from outside the container yet effectively resist internal pressure therein.

3,881,631

MONITOR FOR AIR PRESSURE TYPE SEED PLANTER

Leo J. Loesch, and Claude E. Loesch, both of Kimball, Minn. 55353

Filed Aug. 10, 1973, Ser. No. 387,320
Int. Cl. B65g *15/02*
U.S. Cl. 221—6 13 Claims



1. In combination, a seed dispenser comprising a rotating drum containing superatmospheric air and a supply of seed, and including stationary seed-carrying tubes each positioned to serially receive seeds from inner peripheral apertures in the drum and each seed-carrying tube having an exterior, seed-delivering end to which the seeds are swept by the superatmospheric air for planting, and

a continuously acting monitor for detecting air flow in the seed-carrying tubes so as to indicate obstructions therein and comprising vacuum indicators and vacuum transfer tubes, the latter each having one end positioned relative to a respective seed-carrying tube as to produce a vacuum in the vacuum transfer tube in response to the sweep of superatmospheric air through the seed-carrying tube, the other end of each transfer tube communicating with a vacuum indicator for continuous visual readout of the vacuum so produced.

3,881,632

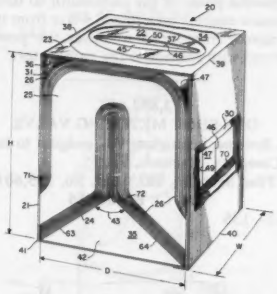
COMPACT DISPENSING PACKAGE

Allen D. Early; Michael D. Danyi; William A. Cox, and Thomas J. Slone, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 11, 1973, Ser. No. 378,303
Int. Cl. B65h *1/04*
U.S. Cl. 221—50 2 Claims

1. A compact dispensing package for sheet material comprising a top-dispensing form-sustaining carton, a Y-shape support member comprising two arms and a stem joined together at a juncture, and a bundle of sheets of flexible material, said support member being inverted in the carton so that it divides said carton into a horizontally extending triangular cross-section tubular space bounded by the arms of said support member and the bottom wall of said carton, and a bundle accommodating space above the arms of said support member, said bundle of sheets being U-folded and draped substantially symmetrically over said inverted Y-shape support member, said carton, said support member, said sheets, and said bundle being so configured that the downwardly extending distal ends of the U-shpae bundle flare outwardly by virtue of resting on upwardly facing surfaces of the arms of the inverted Y-shape support member so that the flared ends of the bundle substantially fill the portions of the lower interior corners of the carton disposed above the arms of said support member

and said bundle substantially fills said bundle accommodating space without substantially compressing or restraining said bundle, and said carton, said stem, said sheets and said bundle being so configured with respect to each other that the ends of the uppermost sheet of said bundle are spaced from said bottom wall a distance at least equal to the elevation of said juncture above said bottom wall whereby the bundle is substantially precluded from shifting during shipping or other handling without substantially impairing the dispensability of said sheets, said sheets being longitudinally U-folded and



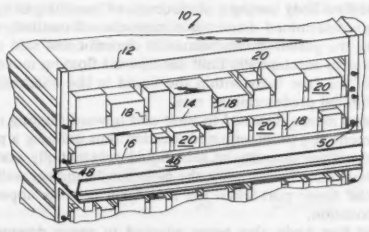
interleaved to promote pop-up dispensing, said uppermost sheet comprising a top fold and a bottom fold, said top fold being longitudinally folded into a first quarter-fold, a one-half fold, and a second quarter-fold disposed intermediate said first quarter-fold and said one-half fold, said first quarter-fold underlying said second quarter-fold and being contiguous therewith, and said second quarter-fold underlying half of said one-half fold, said quarter-folds and said one-half fold each having an edge extending along an edge of said bundle whereby the distal edge of said one-half fold extends along the longitudinal centerline of said bundle.

3,881,633

APPARATUS FOR DISPENSING ITEMS FROM SHELVES

Lynn J. Bradt, Easton, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Apr. 2, 1973, Ser. No. 347,249
Int. Cl. B65g *47/10*
U.S. Cl. 221—123 **4 Claims**



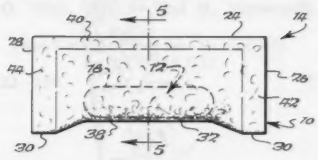
1. Apparatus for dispensing items comprising a frame, said frame having a plurality of superimposed horizontally disposed shelves, lane dividers supported by said shelves to define parallel lanes, a slider in each lane for pushing against the rear end of a row of items, at least some of said lane dividers including an endless member extending around guides adjacent to an supported by end portions thereof, each endless member being coupled to a slider in an adjacent lane, a carriage mounted on a rear side of the frame for reciprocation in a first direction behind the shelves, motor means for selectively moving an endless member for pushing its associated slider along its lane, said motor means being mounted on said carriage for reciprocation on the carriage in a second direction perpendicular to said first direction, a conveyor means on the front side of the frame for receiving items pushed off the shelf by one of the sliders and for conveying the item to a discharge point, first support means on the rear side of said frame supporting said carriage, second support means on the front side of said frame supporting said conveyor means.

3,881,634

INHALANT DISPERSER

James L. Thrun, Orchard Park, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Filed July 16, 1973, Ser. No. 379,362
Int. Cl. B67b *7/24*
U.S. Cl. 222—3 **11 Claims**



1. An inhalant disperser comprising: an enclosure; a frangible ampoule containing a vaporizable liquid and encapsulated within said enclosure; said enclosure comprising an outer layer of liquid absorbing paper and a protective inner layer of impermeable material; said enclosure being shaped to define a pocket for said ampoule wherein said protective inner layer extends around a major portion of the periphery of said ampoule so as to confine ampoule fragments within said enclosure and prevent egress of such fragments outwardly through said enclosure; said enclosure also being shaped to include an interior region extending from said pocket; said enclosure comprising a pair of opposed wall portions each having said outer layer and said protective inner layer, said wall portions being integrally joined together along a common edge and shaped to form said pocket, the wall portions extending from said pocket in a converging relation to a common juncture; said protective inner layer fitting snugly around said ampoule to maintain the latter in substantially fixed position within said enclosure; the remaining edges of said opposed wall portions being sealed together to complete said enclosure; and at least certain portions of said inner layer in communication with said extending interior region of said enclosure having means for establishing passage of said liquid through said inner layer for impregnating said liquid absorbing paper.

3,881,635

COMPRESSIBLE TUBE SQUEEZING DEVICE

Roberto Canedo-Ramirez, Calle de Isabel Lozan Vda. de Betti No. 116, Mexico 13, D.F., Mexico

Filed Apr. 1, 1974, Ser. No. 456,774
Int. Cl. B65d *35/34*
U.S. Cl. 222—99 **15 Claims**

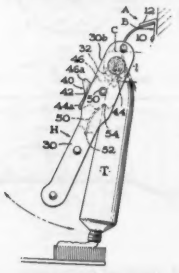
1. A content-expelling squeezing device for use with compressible tubes having a tapering and flattened distal end portion opposite a removable capped end, said squeezing device comprising the following components in combination:

a. a mounting bracket comprising plate means and having opposite ends terminating in transversely projecting offset portions for retention of a resilient back-up plate member interposed therebetween in a bowed/curved manner;

b. said bracket having shaft-mounting means including rigid laterally spaced shaft-support arms also projecting transversely from and unitarily with said bracket intermediate said offset end portions;

c. an elongated shaft rotatably disposable in said shaft support arms in spaced relation forwardly of said base bracket plate means, said shaft having longitudinal slot means including an elongated slot opening along a major part of one longitudinal side of said shaft for receiving the flattened distal end of a compressible tube therein;

d. a relatively thin semi-rigid resilient back-up plate of a width so as to fit between said shaft-support arms and having a length substantially greater than the distance between the offset end portions of said mounting bracket, said plate adapted to be resiliently interposed in a stressed curved manner between said offset end portions and between said shaft and said bracket plate means; and



e. handle means for rotating said shaft, including a hand-operated lever having one end portion with one-way drive operatively connected to one end of said elongated shaft so as to impart repeating rotation to said shaft in one direction of rotation;

f. said components being proportioned and disposed so that a compressible tube is windable upon said shaft and selectively progressively drawn between said shaft and an adjacent portion of said semi-rigid resiliently mounted back-up plate responsive to selective manual operation of said handle means.

3,881,636

APPARATUS FOR DISPENSING SPARKLING BEVERAGES BY SINGLE DOSES

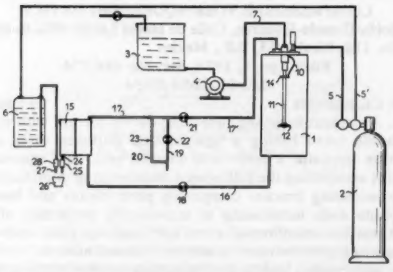
Jean-Pierre A. D'Aubreby, 173 Avenue du 4 Septembre, Douai, France

Filed June 19, 1973, Ser. No. 371,348

Claims priority, application France, June 20, 1972, 72.22207; Mar. 13, 1973, 73.08801

Int. Cl. B67d 5/56

U.S. Cl. 222—129.4 **10 Claims**



1. Apparatus for dispensing sparkling beverages comprising a carbonator having an enclosure capable of being placed in communication with a source of water and a source of pressurized carbon dioxide, means in said carbonator for causing the carbon dioxide to dissolve in the water by intimate mixing of the two component elements, at least one normally empty dosage size chamber means communicating by first conduit means with the liquid phase of said carbonator, second conduit means connecting the top of said chamber means with the gaseous phase of said carbonator, said first and second conduit means having programmed valves, calibrated gas flow restricting means communicating with both the chamber means and the atmosphere, said restricting means being adapted to maintain in the gaseous phase of said chamber means a slight depression with respect to the pressure prevailing in the gaseous phase of the carbonator so that this difference in pressure enables pressurized water from the carbonator to be rapidly introduced whatever the position of the chamber means with respect to the carbonator.

3,881,637

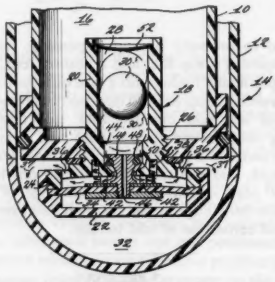
ONE-SHOT METERING VALVE

Kenneth A. Browne, Lexington, Va., assignor to Browne Engineering Company, Staunton, Va.

Filed Sept. 10, 1973, Ser. No. 395,601

Int. Cl. B67d 5/56

U.S. Cl. 222—136 **21 Claims**



1. A liquid metering valve operated by pressure reductions, said valve comprising:

a cylindrical chamber having a predetermined diameter dimension and connected to continuously and freely receive a supply of said liquid through an upper port,

said chamber having a valve seat formed therewithin about a lower port, and

a free body disposed within the chamber,

said free body having a predetermined specific gravity and predetermined diametral dimensions substantially equal to the predetermined diameter dimension of said chamber to substantially limit the upward floating movement of the free body within the liquid in the chamber to a limited predetermined rate,

a stop means disposed to limit said upward floating movement at a predetermined location thus defining a predetermined quantity of said liquid substantially confined between the free body, the cylindrical chamber walls and the lower port when the free body is at its uppermost location,

said free body also being adapted to move downwardly while also preventing substantial fluid flow therearound because of the substantially equal free body and chamber dimensions thus forcing said predetermined quantity of liquid from the lower port when the fluid pressure is lowered thereat and said free body also being adapted to cooperate with said valve seat when in its lowermost position and thus positively preventing further liquid from leaving said lower port until the fluid pressure at said lower port has been thereafter raised thus permitting the free body to float upwardly within the chamber but only at said limited predetermined rate to recondition the

valve for another operation after a predetermined elapsed time.

3,881,638
TAMPERPROOF SECURING DEVICE

Hans Grothoff, 5882 Meuerzhagen 2 auf der Hardt 20, Meuerzhagen, Germany

Continuation-in-part of Ser. No. 236,700, March 21, 1972, Pat. No. 3,851,803. This application May 15, 1972, Ser. No. 253,161

Claims priority, application Germany, May 13, 1971, 2123796

Int. Cl. B67b 5/00

U.S. Cl. 222—153 12 Claims

1. A tamperproof securing device used in combination with a spray cap for aerosol cans, the cap including a groove-like recess extending along a diameter thereof, an aperture formed in the cap at the approximate center of the recess, whereby a spray nozzle may extend therethrough, the recess increasing in width from the center to both sides and sloping down towards the top of the can; a cover member configured to correspond to the geometric shape of the recess and at last partially enclosing the nozzle, sais cover member comprising at least one dependent flange extending tranversely of the recess length and bent towards the base of the recess, said cover member being wider than the groove-like recess and including peripheral bearing portions bearing on and connected to the spray cap.

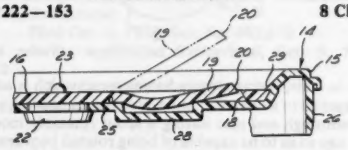
3,881,639
SAFETY CLOSURE FOR CONTAINERS

Walter M. Herip, Cleveland, Ohio, assignor to Weatherchem Corporation, Twinsburg, Ohio

Filed Dec. 5, 1973, Ser. No. 422,013

Int. Cl. B65d 25/44

U.S. Cl. 222—153 8 Claims



1. In combination, a dispensing container and an end closure wherein said end closure comprises a stationary cap secured on one end of said container and a disc rotatably disposed on said cap, said cap including a laterally extending end portion and a recess means in said end portion, said disc being carried on said end portion and extending over said recess means, said disc including a disc opening providing the sole means in said disc for dispensing the contents of said container and a tab movable between an open position for opening said disc opening and a closed position for closing said disc opening, said tab being axially aligned with said recess means only when said disc is rotated to a predetermined position on said cap, said tab being deflectable in said closed position from a normal flat configuration to an inwardly curved configuration into said recess means when said tab is axially aligned with said recess means to open said tab, said cap end portion supporting said tab and preventing said inward deflection whenever said disc is rotated away from said predetermined position, and said recess means providing the sole means in said cap for receiving said inwardly curved tab and said tab being openable only when said disc is rotated to said predetermined position in which said tab is axially aligned with said recess means.

3,881,640
APPARATUS FOR MEASURING LIQUID IN THE RECONSTITUTION OF ANTIBIOTICS

Terrance O. Noble, 1416 E. 72nd St., Minneapolis, Minn. 55423

Filed Dec. 12, 1973, Ser. No. 423,974

Int. Cl. B67d 5/38

U.S. Cl. 222—158 7 Claims

1. A device for dispensing liquid from a source of liquid having a flexible outlet supply tube, comprising:

a. a substantially enclosed vessel having top, bottom and side walls;

b. an inlet tube mounted in said vessel top wall for filling the vessel, said inlet tube having a first end located inside of the vessel adjacent to said side wall and a second end outside the vessel adapted for connection to the supply tube of said source of liquid;

c. inlet valve means for selectively controlling liquid flow through said inlet tube;

d. an air vent tube located in the top wall of said vessel for venting air to and from said vessel;

e. outlet means in the bottom wall of said vessel for dispensing liquid from said vessel;

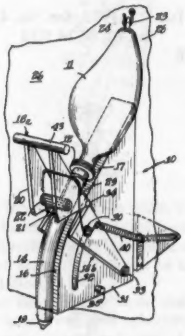
f. a flexible outlet tube having first and second ends, said first end securely attached to said vessel outlet means in fixed spatial relationship with said vessel;

g. outlet valve means fixably located relative to said vessel outlet means for selectively controlling the flow of liquid through said flexible outlet tube; and

h. a rigid positioning tube insertable into the second end of said flexible outlet tube, the upper end of said positioning tube defining an enlarged head portion to frictionally engage the inside of the outlet tube; said positioning tube further including a shoulder portion spaced a predeter-

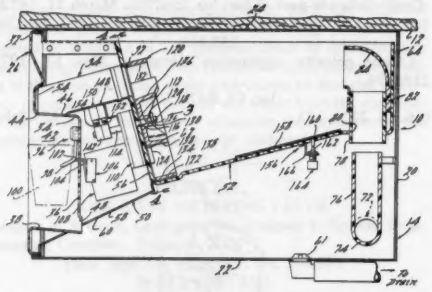
mined distance from the enlarged head portion for abuttable engagement with the second end of said outlet tube to locate the positioning tube in fixed spatial relationship to said flexible outlet tube; and said outlet valve means comprising a finger operated clamp moveable between tube clamping and tube release positions, said clamp having a clamp body with a positioning recess to retainably receive the enlarged head portion of the positioning tube for retaining said clamp.

3,881,641
DISPENSING DEVICE
Frank Victor Pliml, Jr., Arlington Heights, and Ernest William Reinwall, Jr., McHenry, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Oct. 31, 1973, Ser. No. 411,231
Int. Cl. B65d *37/00*
U.S. Cl. 222—207 **9 Claims**



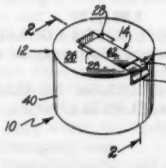
1. A dispensing device for selectively discharging a quantity of flowable material from a container having a fitment to receive a discharge nozzle, including a block member having an arcuately-shaped convex surface positioned beneath said container and extending outwardly therefrom, said arcuately shaped convex surface leading into a support surface which is positioned beneath said container, and the juncture between said support surface and said arcuately shaped convex surface provides a fluid flow control area for directing a quantity of the flowable material within said nozzle toward a dispensing end thereof while substantially preventing the flowable material from being urged upwardly back into said container, said nozzle being formed of a flexible tube communicating with and extending from said container and in contact with said arcuately shaped convex surface to conform substantially to the contour thereof, said flexible tube being resilient to permit collapse thereof and squeeze a quantity of flowable material therefrom, an arm member positioned above said flexible tube and providing spaced-apart flange portions positioned on opposite sides of said flexible tube, said arm member being mounted for in a direction beginning at and along said support surface for progressively squeezing said flexible tube arcuately and downwardly to urge the quanity of flowable material therein through the dispensing end of said nozzle, wherein said block member includes an arcuately shaped slot formed therein, said arcuately-shaped slot being projected from a pivot point which also corresponds to the center of the radius of curvature of said arcuately-shaped surface and wherein said arm member includes a guide extending into said arcuately-shaped slot for travel within said slot through a predetermined distance, and further including means extending from said block member to provide an adjustable stop against which said arm member engages at the end of travel thereof of the flowable material to control volume dispensed.

3,881,642
ICE DISPENSING APPARATUS
Walter Hardold Hoenisch, Albert Lee, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.
Filed Sept. 10, 1973, Ser. No. 395,659
Int. Cl. F25c *5/16*
U.S. Cl. 222—370 **31 Claims**



1. An ice dispensing apparatus comprising,
an ice storage bin,
conveying means for communicating ice from the apparatus toward an ice receptacle or the like,
a dispensing rotor having a portion thereof in communication with ice within said storage bin and operable upon selective rotation thereof to transmit ice to said conveying means, and control means operable during a vend cycle to rotate said dispensing rotor a predetermined amount and for stopping rotation of said rotor at the end of said cycle, and after said vend cycle rotating said rotor a predetermined additional amount and thereby predeterminately positioning said rotor subsequent to said vend cycle.

3,881,643
CHILD RESISTANT CLOSURES WITH LEVER OPENING
Donald H. LaVange, Uxbridge, Mass., assignor to Polytop Corporation, Slatersville, R.I.
Filed Nov. 2, 1973, Ser. No. 412,158
Int. Cl. B67d *3/00*
U.S. Cl. 222—505 **9 Claims**



1. In a dispensing closure having a cap which is adapted to be secured to a container and which has an opening extending therethrough and also having a spout rotatably mounted on said cap so as to be capable of being rotated between a closed position in which the spout seals off the opening and an open position in which the spout is in alignment with the opening the improvement which comprises:
said spout being located on said cap so as to be normally incapable of being engaged so as to be rotated from said closed position to said open position,
a first order lever means located on said cap for rotating said spout from said closed position,
said spout and said lever means being separate elements, neither of which performs the function of the other,
fulcrum means located on said closure serving as a fulcrum for said lever means,

a portion of said lever means being exposed to the exterior of said cap when said spout is in said closed position.

3,881,644

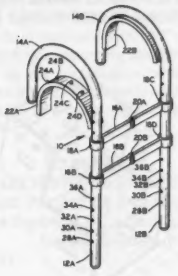
CONVERTIBLE AND COLLAPSIBLE BACKPACK

Donald R. Demaline, 2245 University Hill Blvd. Apt. 205 B, Toledo, Ohio 43606

Filed Feb. 14, 1974, Ser. No. 442,759

Int. Cl. A45f *3/10*

U.S. Cl. 224—25 A **3 Claims**



1. A portable knapsack frame supporting interchangeably various carriers comprising:

a. a pair of J-shaped bar members disposed in mutually parallel fashion, a collapsible and hinged bar member having sleeves at the ends thereof, each of said J-shaped bar members being received in a corresponding sleeve, means for attaching said J-shaped bar members in said sleeves, said hinged bar member joining said J-shaped bars so that the J-shaped bar members can be moved towards one another by folding of the hinged bar members, said J-shaped bar members having therein a plurality of apertures for receiving bolt members;

b. a carrier having projecting sleeve members for attachment to the J-shaped members;

c. said sleeve members being slidably received on said J-shaped bars and adapted to be fixed relative to said carrier by a bolt being locked through each sleeve member and a corresponding aligned aperture in said J-shaped bar members.

3,881,645

APPARATUS FOR THE GROUPWISE PACKAGING OF BAGS

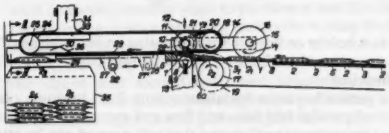
Georg Kopp, Neuhausen am Rheinfall, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Oct. 4, 1973, Ser. No. 403,672

Claims priority, application Switzerland, Oct. 5, 1972, 14546/72

Int. Cl. B26f *3/00*; **B65b** *63/00*

U.S. Cl. 225—94 **7 Claims**



1. In an apparatus for the groupwise packing of bags, the apparatus including a conveyor for transporting a coherent bag band of indefinite length, the bag band being formed of interconnected bags arranged in succession along the direction of transport, and further arranged in rows extending transversally to the direction of transport, each bag row containing a plurality of bags connected to one another by a longitudinal weakened portion extending in the direction of transport, each bag row being connected to the adjoining bag row by means of a transversally extending weakened portion, the bag band including, when viewed in the direction of transport, a leading or first bag row and an adjoining or second bag row, the improvement comprising separating means for separating said first bag row from said bag band along the weakened portion between said first and said second bag rows; a slide extending downstream of said conveyor and said separating means for receiving said first bag row separated from said bag band; endless belt means extending immediately adjacent and substantially parallel to said slide for engaging said first bag row and moving it on and along said slide; cutting means affixed to said slide and oriented in alignment with each said longitudinally weakened portions for separating the bags of the first bag row from one another during their movement on said slide by virtue of said second conveyor; ledge means forming part of said slide and disposed downstream of said cutting means for receiving the individual separated bags of said first bag row, said ledge means constituting the sole support of said individual bags by engaging longitudinal edge portions thereof; and stripper means arranged for movement adjacent said ledge means for pushing said individual bags off said ledge means to cause them to fall onto a predetermined location, whereby at least one bag stack is formed during continuing operation of said apparatus.

3,881,646

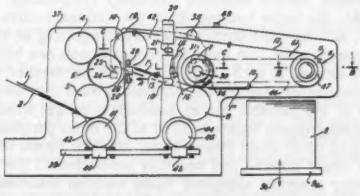
SHEET TRANSPORTING UNIT FOR USE IN PRINTING MACHINES OR THE LIKE

Erhard Nitzsche, Dohna; Peter Zirnstein, Rathmannsdorf; Erwin Schebiella, Heidenau; Siegfried Korner; Joachim Weise, Dresden; Horst Schlaugat, Heidenau, and Wolfgang Richter, Krippen, all of Germany, assignors to Veb Polygraph Leipzig Kombinat für Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Aug. 14, 1973, Ser. No. 388,233

Int. Cl. B26f *3/00*

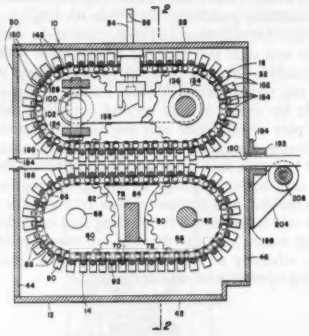
U.S. Cl. 225—96 **19 Claims**



1. In a machine for manipulating imprinted sheets, particularly in a machine for providing imprinted sheets with cutouts and for separating the cutouts from the remnants of the respective sheets, a combination comprising a plurality of sheet treating members including a rotary sheet treating member; a sheet transporting unit including at least one endless flexible element, having a stationary portion and a longitudinally spaced movable portion which is pivotal relative to said stationary portion, and said sheet treating member being located where said movable portion pivots relative to the sheet treating member, sheet gripping devices connected with said flexible element, and guide means for said gripping devices, said guide means comprising fixed first portions and movable second portions; and drive means actuatable to move a portion of said flexible element and said second portions of said guide means about a pivot axis which is at least closely adjacent to the axis of said rotary sheet treating member between an operative position in which said first and second portions of said guide means define for said gripping devices an endless

path and an inoperative position in which said path is interrupted.

3,881,647
ANTI-SLACK LINE HANDLING DEVICE
Baron C. Wolfe, Eureka, Calif., assignor to LeBus International, Inc., Longview, Tex.
Filed Apr. 30, 1973, Ser. No. 355,921
Int. Cl. B65h 17/34
U.S. Cl. 226—172 **10 Claims**

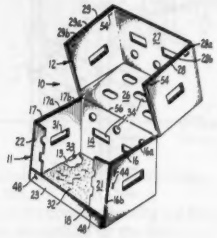


1. An anti-slack line handling device for maintaining constant tension of wire ropes and the like while being unreeled or re-reeled by a standard winch device, the line handling device comprising a lower housing, a stationary carrier assembly secured within said lower housing, said stationary carrier assembly comprising a first drive sprocket wheel rotatably secured to the housing, a second drive sprocket wheel rotatably secured to the housing and spaced from the first drive sprocket wheel, and endless roller chain means disposed around the outer periphery of the said drive sprocket wheels for transmitting rotation therebetween; gripping means secured along the outer periphery of the roller chains means; an upper housing removably connected to the lower housing, a movable carrier assembly vertically reciprocally disposed within the upper housing above the stationary carrier assembly, said movable carrier assembly comprising an elongated frame member, two spaced sprocket wheels one being rotatably secured to each end of the said frame member, a second endless roller chain means disposed around the outer periphery of the movable carrier assembly sprocket wheels and a second gripping means secured to the outer periphery of the second roller chain means; linear actuator means secured to the upper housing and operably connected to the movable carrier assembly elongated frame member intermediate the spaced sprocket wheels thereof said linear actuator means being adaptable to apply pressure directly against the stationary carrier assembly thereby gripping the wire rope therebetween and drive means secured to the lower housing and operably connected to the stationary carrier assembly for applying rotary power to the drive sprocket wheels of the stationary carrier assembly, and line guide means secured to the lower housing for guiding said wire ropes into and out of the anti-slack line handling device.

3,881,648
CONTAINER FOR ASPARAGUS AND THE LIKE
Richard A. Hall, Pleasanton, Calif., assignor to Willamette Industries, Inc., Portland, Oreg.
Filed Oct. 18, 1973, Ser. No. 407,408
Int. Cl. B65d 5/00
U.S. Cl. 229—6 R **2 Claims**

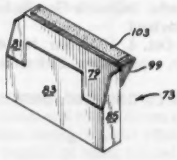
1. A box shaped container for handling asparagus spears and the like, comprising:

a. a single corrugated cardboard blank having; a rectangular front panel, a rectangular top panel, a rectangular rear panel, a rectangular bottom panel,
b. the front, top, rear and bottom panels lie along the central portion of the blank and are attached to adjacent panels along common edge scores,
c. each of said rectangular panels have opposed pairs of end panels attached along edge scores at the margins of the rectangular panels,
d. a series of narrow ledge panels attached along edge scores of the bottom panel and its associated end panels,
e. the container is set up by folding the blank along the edge scores to form a lid section and a base section,



f. the lid section is formed by the front and top panels and by their adjacent end panels secured in overlapping cross ply relation,
g. the base section is formed by the rear and bottom panels and by their adjacent end panels secured in overlapping cross ply relation and by the inwardly folded ledge panels secured together in the opening opposite the rear panel,
h. the edge score common between the top and rear panels forms the hinge between the lid and base sections such that the container may be opened and closed by pivoting the lid section into overlying relation over the base section wherein the ends of the container will be of four ply thickness.

3,881,649
HOLDERS HAVING FOLDABLE SUPPORT
Richard G. Krautsack, Arlington Heights, Ill., assignor to The Cooperative Marketing Co., Elmhurst, Ill.
Filed Apr. 29, 1974, Ser. No. 464,855
Int. Cl. B65d 5/06
U.S. Cl. 229—38 **9 Claims**



1. A holder or the like for presenting an assemblage of items to be taken therefrom on a one-by-one basis, which holder comprises

a generally planar foldable support sheet having a plurality of parallel fold lines and first and second adhesive attachment means so disposed that said support can be attached to differently oriented surfaces,

said support comprising a main section, a first attachment section, a second linking section and a third connection section which are serially connected to one another at said fold lines,

said first and second adhesive attachment means disposed, respectively, upon the front surface of said first and third sections,

said sections being proportioned so that

by folding said first section rearward about 180° and said third section about 180° relative to said second section and by connecting said third section to one location on the rear surface of said sheet via said second adhesive attachment means, said holder is adapted for attachment to a forward-facing surface via said first adhesive attachment means, or alternatively

by folding said second section rearward about 180° to lie generally adjacent the rear surface of said first section and said third section about 180° relative to said second section and by connecting said third section to a second location on the rear surface of said sheet, said holder is adapted for attachment via said first adhesive attachment means to a rearward-facing surface.

3,881,650

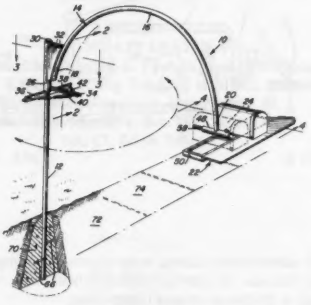
ARCH SWING-AWAY STAND

Cleon A. Schmidt, Box 34, R.F.D. 1, Glidden, Wis. 54527

Filed Sept. 12, 1973, Ser. No. 396,370

Int. Cl. B65d *91/00*

U.S. Cl. 232—39 **1 Claim**



1. A mailbox support stand, comprising, in combination:

a. a pole, at least one projection is provided on the pole and arranged extending therefrom for reinforcing cement in which the pole is disposed;

b. an arm including an arch terminating in a pair of ends;

c. means for mounting a one end of the arch on the pole for permitting swinging movement of the arch with respect to the pole, the means for mounting including a sleeve having an open end and a spaced enclosed end and arranged over the pole open end first, and means for connecting the arch to the sleeve, the means for connecting including a pair of parallel plates arranged affixed to and extending between the sleeve and arch, the plates having a shape in plan that conforms along one edge to the shape of the arch and along another edge to the sleeve, and the means for mounting further including means for biasing the arch toward a predetermined rest position, the means for biasing including a first bracket cantilever mounted on the sleeve and second and third brackets cantilever mounted on the pole and arranged perpendicular to the first bracket and extending coaxially from one another in a plane parallel to the plane of the first bracket, and a pair of coiled tension springs, one spring arranged connected to and extending between free ends of the first and second brackets and the other spring connected to and arranged extending between the free end of the first bracket and a free end of the third bracket;

d. a hollow member forming a socket and affixed to the other end of the arch; and

e. a support connected to the other end of the arch, the support including a planar framework forming a platform, a cover affixed to the framework and having a planar extension arranged extending away from the pole, framework, and arch in a plane parallel to the plane of the framework to extend substantially forwardly of a mailbox to be mounted on said framework for forming a snow guard, and a longitudinal member mounted on the framework and adjustably arranged in the hollow member for attaching the framework to the arm.

3,881,651

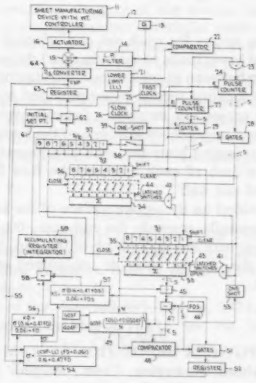
CONTROL SYSTEM AND METHOD FOR AVERAGE VALUE SETPOINT

Robert G. Wilhelm, Jr., Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Nov. 12, 1973, Ser. No. 414,833

Int. Cl. G06g *7/66;* **G06f** *15/46*

U.S. Cl. 235—151.13 **5 Claims**



1. In a system for controlling the average value of a material property,

means for monitoring the property for deriving a first signal indicative of values of the property,

control means responsive to the comparison of said first signal and a setpoint signal to derive a third signal to control the material average property value, said control means selectively cumulating combinations of said stored signals to derive said setpoint signal,

means responsive to the first signal for deriving separate signals for each of several different time intervals indicative of the statistical spread of values of the first signal during each of said time intervals;

means for separately storing said second signals for at least three of said time intervals;

said control means selectively cumulating combinations of said stored second signals to derive said setpoint signal.

3,881,652

RAIL FASTENING ASSEMBLY

Gerald Jacobson, 53 Northfield Ave., Glenhazel, Johannesburg, Transvaal Province, South Africa

Filed Mar. 20, 1973, Ser. No. 343,153

Int. Cl. E01b *9/04*

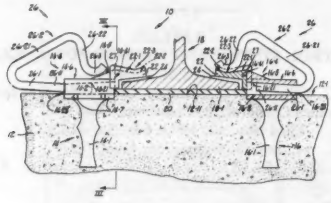
U.S. Cl. 238—349 **10 Claims**

1. A rail fastening assembly comprising:

a rail sleeper having at least one rail seat and at least one seating formation associated with each rail seat for the

lower limb of a resilient rail clip, the whole of the seating formation being disposed alongside its rail seat;

a rail clip for clip seating formation, each rail clip having a lower limb engageable with its seating formation and an upper limb which is longer than the lower limb and which is adapted to bear downwardly on the foot flange of a rail on the associated rail seat, the clip being bodily movable lengthwise along the sleeper between an unclamped position in which the upper limb is free of the foot flange of the rail and a clamping position in which it bears downwardly on said foot flange;



clip locating means for each rail clip adapted to force the upper and lower limbs of said clip apart during movement of the clip between its unclamped and clamping positions, each clip locating means being provided by a vertically disposed projection extending laterally relative to the sleeper, and engageable with one of the limbs of the clip; a gauge adjusting plate for each clip insertable between the upper limb of each clip and the foot flange of the associated rail; and

a ramp provided on the upper surface of the sleeper which slopes upwardly towards the rail seat, the ramp being engageable with the upper limb of the clip, during movement of the clip between its unclamped and clamping positions.

3,881,653

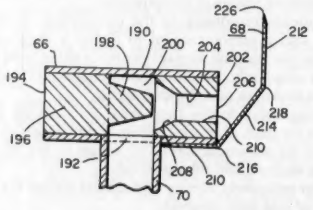
POWDER DEPOSITION SYSTEM

Lennox Birckhead, Rowayton, Conn., assignor to Vitek Research Corporation, Stamford, Conn.

Division of Ser. No. 210,723, Dec. 22, 1971, Pat. No. 3,777,874. This application Nov. 20, 1973, Ser. No. 417,632

Int. Cl. B05b *5/00;* **F23d** *11/28*

U.S. Cl. 239—15 **17 Claims**



1. A spray nozzle through which a gaseous suspension of particulate, thermoplastic material is adapted to be directed onto a substrate surface, said spray nozzle comprising:

A. an elongate, hollow body member;

B. a baffle means within said body member, said baffle means including a transversely continuous, elongate surface tapering in a downstream direction of said body member and being spaced from an inner surface of said body member to define an entrance chamber between the inner surface of said body member and the elongate surface of said baffle means;

C. a discharge outlet chamber in continuous communication with said entrance chamber and terminating in a downstream end thereof in an exit orifice; said entrance chamber and discharge outlet chamber defining a continuous elongate passage;

D. an inlet port disposed in a side wall of said body member, said inlet port having an axis substantially transverse to the direction of elongation of said elongate passage; and

E. the elongate surface of said baffle means being disposed in overlying relationship with said entrance port, whereby a gaseous suspension of particulate material entering said body member through said entrance port will be mixed within said entrance chamber of the elongate passage and directed in a downstream direction through the exit orifice of said discharge outlet chamber.

3,881,654

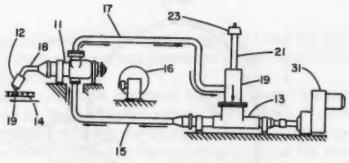
BATTERY PASTE PUMPING AND METERING SYSTEM

Terrance M. Larkin, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 244,485, April 17, 1972, Pat. No. 3,814,628. This application Dec. 3, 1973, Ser. No. 421,304

Int. Cl. B05b *9/00;* **B05c** *1/16;* **H01m** *35/00*

U.S. Cl. 239—127 **22 Claims**



1. A substantially closed loop system for pumping and metering viscous thixotropic electrochemically active paste through a discharge means comprising:

a. inlet means for charging make-up paste to said closed loop system;

b. first pump means for agitating and circulating said paste around the loop;

c. second pump means, downstream of said first pump means, for initiating flow of a portion of the circulating paste away from the closed loop to the discharge means; said second pump means metering a predetermined volumetric flow rate of paste to said discharge means.

3,881,655

SPRINKLER

Robert Mimeur, Sallanches, France, assignor to Cárpano & Pons S.A.

Filed June 19, 1972, Ser. No. 264,345

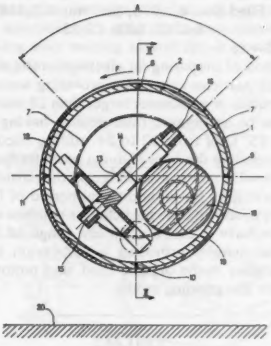
Claims priority, application France, June 18, 1971, 71.22267

Int. Cl. B05b *3/04*

U.S. Cl. 239—240 **4 Claims**

1. A sprinkling device comprising; a hollow outside cylinder; a hollow inside cylinder coaxially mounted therein and fitted into it so that it can freely revolve against it; housing means associated with said cylinders for providing an enclosure and defining an entrance for liquid into the enclosure; means for continued rotating of the inside cylinder in the outside cylinder; the inside cylinder being perforated by a plurality of arcuately spaced rows each comprising a plurality of relatively small openings; and the outside cylinder having at

least one relatively large arcuate opening enabling the liquid to pass through the openings of successive rows of the inside



cylinder and to spurt out through the opening of the outside cylinder.

3,881,656

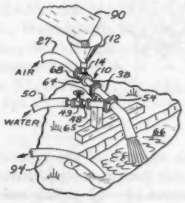
MIXING APPARATUS

Reinhold S. Markfelt; Rueben E. Paulson, both of Minneapolis, and Henry E. Benson, Long Lake, all of Minn., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 15, 1974, Ser. No. 443,047

Int. Cl. B05b *7/14*

U.S. Cl. 239—336 **8 Claims**



1. Apparatus for continuously feeding a supply of powdered material into a liquid stream and mixing it therewith comprising a powder supply portion adapted to receive compressed gas and powdered material and to selectively supply a mixture of compressed gas and powdered material to a molded wye-shaped mixing portion removably attached thereto, said mixing portion comprising a pair of hollow inlet branch portions arranged side by side at an angle of less than 90° to each other and forming a common hollow outlet stem portion, said inlet arm portions each having a smaller cross-sectional area than said outlet portion, said inlet and outlet portions being blended together to define a smooth-walled mixing chamber, said powder supply portion being removably attached to one of said pair of inlet branch portions and the other of said pair of inlet portions being adapted to be removably attached to a source of liquid, an outlet nozzle removably attached to said outlet stem portion, said outlet nozzle including an angled flow path, and bracket means on said apparatus for mounting said apparatus so that said pair of side by side branch portions will lie in a common plane which is positioned at a small angle to the horizontal to facilitate drainage.

3,881,657

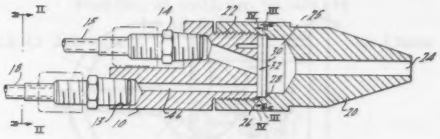
FOAM MIXING HEAD

Fred G. Heimann, Mt. Clemens, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Feb. 14, 1974, Ser. No. 442,601

Int. Cl. B05b *7/10*

U.S. Cl. 239—413 **7 Claims**



1. In a nozzle structure for discharging at least one fluid whose viscosity increases upon discharge, said nozzle having separate inlet passages for at least two fluids, one of which is a solvent for the other, and having a single outlet, improved means for preventing clogging of the nozzle, comprising, in combination, a mixing chamber of circular cross section interposed in the flow path between said outlet and both of said inlets, check valves between each inlet and the mixing chamber, said valves being located on a wall of the mixing chamber to prevent backflow from the chamber toward the inlets, the valve for the solvent being located near the periphery of the chamber and discharging thereinto with a tangential component to cause the solvent to whirl in the mixing chamber.

3,881,658

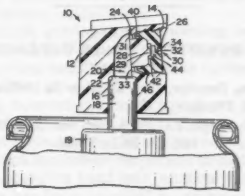
MECHANICAL BREAKUP BUTTON OR ACTUATOR

James E. Greenebaum, II, Highland Park, and Ronald F. Ewald, Rolling Meadows, both of Ill., assignors to Seaquist Valve Company, Cary, Ill.

Continuation of Ser. No. 149,507, June 3, 1971, abandoned. This application May 21, 1973, Ser. No. 358,581

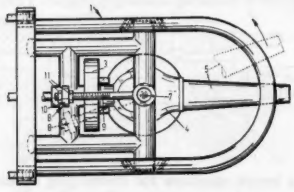
Int. Cl. B05b *1/34*

U.S. Cl. 239—492 **6 Claims**



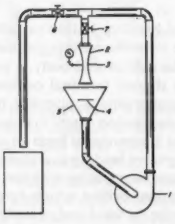
1. A mechanical breakup button or actuator comprising a body with a valve stem recess therein, said recess leading to a depression on the side of said body, a post disposed in said depression, a cup shaped terminal orifice insert including a terminal orifice comprising a plurality of stepped recesses disposed in said depression such that said terminal orifice insert and said post cooperate to form an annular feed groove, said annular feed groove leading to a plurality of passageways, said passageways communicating with the innter most stepped recess of said terminal orifice which forms a swirl inducing chamber between the forward end of said post and the interior of said terminal orifice insert, said chamber communicating with said orifice, said passageways being inclined relative to the outer circumference of said swirl inducing chamber to form chordal passageways such that product is sprayed over product residue in said swirl inducing chamber to minimize potential clogging of said terminal orifice.

3,881,659
SPREADING DEVICE
Pieter Adriaan Oosterling, Nieuw-Vennep, and Johannes Philippus Hooftman, Hoofddorp, both of Netherlands, assignors to H. Vissers, N.V., Nieuw-Vennep, Netherlands
Filed Nov. 28, 1973, Ser. No. 419,673
Int. Cl. A01c *15/00*
U.S. Cl. 239—689 **8 Claims**



1. A device for spreading distributable material, comprising in combination:
- a frame adapted to be attached by a conventional hitch to a tractor;
- a hopper mounted on said frame and having an open lower end;
- a distribution pipe assembly located at the lower end of said hopper to receive material therefrom, said assembly including a generally horizontal distribution pipe adapted to oscillate about a generally vertical axis thereby to spread the material over a wide swath;
- pivot means mounting said distribution pipe assembly for oscillation relative to said hopper and said frame about said axis;
- drive means for imparting said oscillation to said distribution pipe assembly; and
- counterweight means attached to said distribution pipe assembly and disposed on that side of said axis diametrically opposite said distribution pipe for oscillatory movement in unison with said assembly to balance out reactive forces which tent to impart lateral vibration of the spreading device.

3,881,660
MINERAL BENEFICIATION BY DECOMPRESSION SCALPING
Roger S. Ribas, Decatur, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Sept. 13, 1973, Ser. No. 396,952
Int. Cl. B02c *19/06*
U.S. Cl. 241—5 **7 Claims**

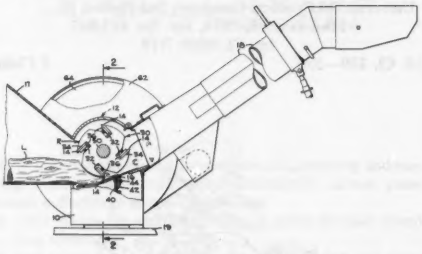


1. Method of separating porous lateritic weathered ore particles into crust and core portions comprising forming a liquid slurry thereof, subjecting the slurry to a pressure between 25 and 100 psig, and releasing the pressure to the atmosphere through a nozzle.

3,881,661
METHOD OF PREPARING AN ELECTROPHORETIC SUSPENSION OF BETA-ALUMINA PARTICLES
Robert W. Powers, and Robert A. Giddings, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 6, 1973, Ser. No. 422,435
Int. Cl. B02c *19/12*
U.S. Cl. 241—15 **3 Claims**

1. A method of preparing an electrophoretic suspension of beta-alumina particles comprises providing water free beta-alumina particles of a diameter larger than 20 microns, adding the particles to an organic fluid vehicle having a dielectric constant at 25° C of from 12 to 24, adding zirconia grinding media, vibromilling the beta-alumina particles for a period of 2 hours to develop a negative charge on the particles, continuing the vibromilling for an additional period of from 7 to 16 hours thereby reducing the particle size wherein a majority of the particles have a diameter in the range of from 1 to 2 microns and thereby providing a suspension of the beta-alumina particles in the organic fluid, and removing the suspension from the grinding media.

3,881,662
REDUCED NOISE LEVEL BRUSH CHIPPER
Arne N. Gunnarsson, Pomona, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Nov. 21, 1973, Ser. No. 418,006
Int. Cl. B02c *1/08*
U.S. Cl. 241—221 **2 Claims**



1. In a brush chipper of the type comprising a housing having a bed knife therein, a shaft driven cutter head having a diameter of about 11 – 13 inches and a length of about 12 inches, said head mounting cutter blades that project only a short distance from the head, feed and disposal chutes on said housing, means for driving said cutter head; and a flywheel on said cutter head shaft; the improvement wherein said cutter head and said flywheel have a combined kinetic energy of about 200,000 ft. lb. at a rotational speed of about 1,550 rpm, said means for driving said cutter head shaft driving the shaft at a standby speed within the range of about 1,200 – 1,600 rpm for causing the noise level generated at the rear of the chipper as the cutter head blades pass the bed knife to be within a range of about 80 dB-A at 100 feet to about 93 dB-A at 20 feet while providing sufficient stored kinetic energy for effective intermittent chipping.

3,881,663
ROLL MILL FOR FLAKING GRAIN AND THE LIKE
Andrew M. Brown, 4535 E. 6th Ave., Denver, Colo. 80220
Filed Feb. 14, 1974, Ser. No. 442,462
Int. Cl. B02c *11/04, 4/38*
U.S. Cl. 241—225 **8 Claims**

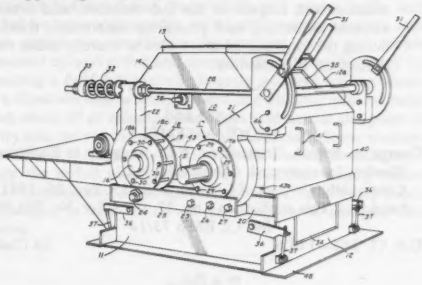
1. A dual roll mill for flaking grain or the like comprising: a housing having front, rear and side walls;

the side walls of said housing having horizontal slots opening toward the front wall thereof;

a pair of mill rolls having shafts extending from the ends thereof;

roll supporting structure adjacent said slots;

means for mounting said rolls in said housing with the shafts thereof extending through said slots, said means including bearing assemblies for said shafts and releasable means for locking said bearing assemblies in position on said supporting structure;



detachable means for closing said slots;

removable closure means at one end of said housing for affording when removed an open passage for said rolls; and,

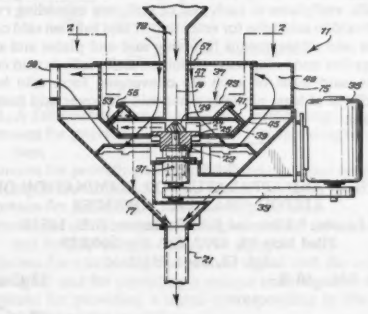
means providing tracks adjacent the lower sides of said slots for affording rolling movement of said roll shafts whereby upon removal of said locking means and said slot closing means and said front wall closure means said rolls may be rolled forward and out through said front wall.

3,881,664

WEAR PLATE IN AN APPARATUS FOR CONDITIONING A GRANULAR MATERIAL

Joseph E. Bowling, Jr., Waynesboro, Pa., and Robert A. Spellman, Falling Waters, W. Va., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 31, 1973, Ser. No. 328,171
Int. Cl. B02c *13/09*
U.S. Cl. 241—275 **11 Claims**



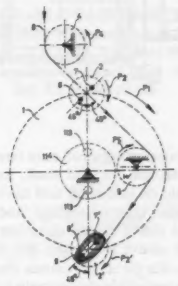
1. An impact surface for an apparatus of the type having a centrifugal throwing wheel mounted for projecting a stream of material against the impact surface, said impact surface comprising a first, second and third closed wall, each wall being spaced from a central axis and shaped like a frustrum with one end being larger than the other end, said first, second and third walls being in coaxial loosely stacked relationship, said first wall having its larger end facing upwardly, said second wall having its larger end facing downwardly, and said third wall having its larger end facing upwardly.

3,881,665

DEVICE FOR PRODUCING ROLL-SHAPED PACKETS OF BAGS OF PLASTIC

Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Dec. 28, 1973, Ser. No. 429,116
Int. Cl. B65h *17/02*
U.S. Cl. 242—67.3 R **11 Claims**



1. A device for producing roll-shaped packets of bags of plastic foil from a continuously supplied web in which the bags are held together through perforations, said device comprising:

two winding heads, each having a plurality of winding fingers which are lengthwise retractable and extendible between an operative position and a retracted position, and which can be moved towards each other between a spreaded position and an inner position for winding and for disengaging, respectively,

the web supply guiding and the winding heads being arranged one with respect to the other such that during winding of one head the web runs in between the winding fingers of the other head,

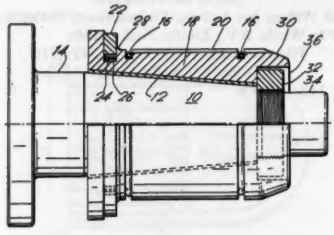
the spacing between said heads being such that there is at any moment at least one web perforation between them, a counter for indicating the number of bag units supplied and a switch mechanism responsive to said counter to set the non-operative head into rotation and to bring the operative head to a standstill to increase the tension on said web between the heads whereby under the tensile stress thus produced a perforation is caused to break and the winding of the web is taken over by the head just started into rotation.

said switch mechanism further retracting the fingers of the standstill head out of the wound roll and subsequently, after a relative change of the web direction and the heads, extending again the fingers of this head with the web running in between these fingers,

both said winding heads are mounted at diametrically opposed locations of a revolvable disc to define two fixed positions with respect to a fixed direction of supply of the foil web,

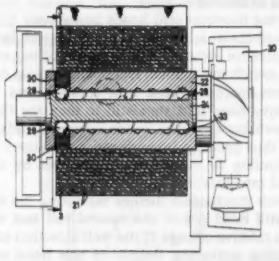
supply means for said web comprising a first roller within the line of circulation of the winding head situated at one side with respect to the vertical through the axis of the revolvable disc, and a second roller outside the line of circulation of the winding heads situated at the opposite side of said vertical.

3,881,666
WINDING CORE CHUCK
Eric Greenhalgh, 40 Red House Ln., Chorley, England
Filed Sept. 5, 1972, Ser. No. 286,208
Int. Cl. B65h 17/02
U.S. Cl. 242—68.2 12 Claims



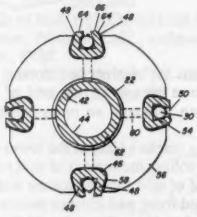
1. A chuck for supporting a roll core comprising a mounting shaft, a tapered section on said shaft, an expandible sleeve axially displaceable on said shaft and having surfaces slidably engageable with said tapered section, and whereby axial displacement of said sleeve in one direction along said tapered section causes the sleeve to expand and displacement of said sleeve in the opposite direction causes the sleeve to contract, and wherein the expandible sleeve includes a thrust ring separate from but axially restrained with respect to the sleeve, and means for maintaining the thrust ring concentric with said shaft and engageable with the end of a roll core when the chuck is inserted into a roll core, said thrust ring serving to cause displacement of the expandible sleeve up said tapered section as the sleeve and shaft are pushed into the roll core.

3,881,667
SAFETY-BELT LOCKING DEVICE
Norbert Karl Albert Tandetzke, Erftstadt-Gymnich, Germany, assignor to Kangol-Teka, Sicherheitsgurt GmbH, Bruhl, Germany
Filed June 20, 1973, Ser. No. 371,938
Claims priority, application Germany, June 24, 1972, 2230994
Int. Cl. A62b 35/00; B65h 63/00
U.S. Cl. 242—107.4 8 Claims



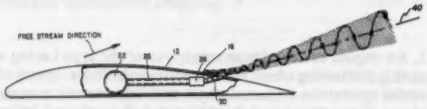
1. A safety-belt apparatus for vehicles comprising:
a drum including an elongate hollow hub member,
a safety-belt wound upon said hub member,
an elongate spindle member positioned interiorly of said hub,
a free-running mechanism operatively associated with the spindle member normally permitting said spindle member to rotate with said hub member to thereby permit extension of the belt, said free-running mechanism when subjected to abnormal acceleration locking the spindle member against rotation with respect to said hub member,
one of said hub and spindle members having threads thereon and the other of said hub and spindle members having an elongate channel therein, one of said hub and spindle members being formed of plastically deformable material,
and a braking element engaging said channel and threads of said hub and spindle members and moving longitudinally of the latter when the spindle member is locked against rotation with respect to the hub member, said braking element deforming said plastically deformable member during the longitudinal movement to thereby brake rotation of the hub member.

3,881,668
SPOOL ASSEMBLY
George A. Poteat, Greensboro, N.C., assignor to Engineered Plastics, Incorporated, Gibsonville, N.C.
Continuation-in-part of Ser. No. 318,515, Dec. 26, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,955
Int. Cl. B65h 75/14
U.S. Cl. 242—118.6 34 Claims



1. A spool assembly comprising a spider-shaped core extending substantially the full length of said spool assembly and having an axially extending center portion and a plurality of longitudinal ribs projecting radially outward from said center portion, each said rib having an outwardly opening longitudinal slot defined by a base and a pair of spaced walls extending from said base along the outer edge of said rib, an exterior tube mounted on and structurally supported by said core throughout substantially its full length at the outer edges of said walls, end plates at each end of said core extending radially outward to said tube for retention of said tube on said core between said plates, means fastening said end plates and said core together and being secured substantially fully in said core rib slots, said walls of each rib converging from said base outwardly to at least partially close said slot over said fastening means.

3,881,669
METHOD AND APPARATUS FOR ELIMINATION OF AIRFOIL TRAILING VORTICES
Martin Lessen, 9 Idlewood Rd., Rochester, N.Y. 14618
Filed May 16, 1973, Ser. No. 360,928
Int. Cl. B64c 23/06
U.S. Cl. 244—40 R 13 Claims



1. Method for rapidly dissipating the vortex trailing an airfoil in flight, said method consisting of injecting a substantially linear fluid stream substantially coaxially into said vortex

(a) in a direction such that there is no more than about four degrees of misalignment between the longitudinal axis of the injected fluid stream and the longitudinal axis of said vortex substantially at the point of entry of the stream into the core of the trailing vortex, and (b) at a substantially linear momentum flux of such magnitude relative to that of the free air stream that said trailing vortex will be rendered hydrodynamically unstable, whereby disturbances and hence turbulence in said vortex will grow rapidly to dissipate said vortex.

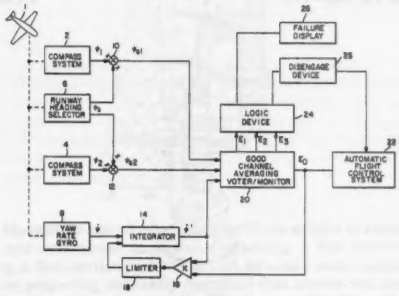
4. An airfoil, said airfoil having an upper surface over which a vortex is formed and from which said vortex trails, said airfoil having a trailing edge, said trailing vortex having a core and defining a curvilinear longitudinal axis, and means mounted on said airfoil and spaced from said trailing edge for injecting a fluid substantially linearly into said trailing vortex in a direction substantially coaxial and colinear with no more than about 4° of misalignment from said axis at the point of entry into the vortex core and at a substantially linear momentum flux of a magnitude relative to the free air stream proximate the airfoil which renders the modified trailing vortex hydrodynamically unstable, whereby disturbances and hence turbulence in said vortex will grow rapidly to dissipate said vortex.

3,881,670

CONTROL SYSTEM WITH DUAL UNMONITORED CONDITION SENSORS AND FAIL OPERATIVE CHARACTERISTICS

Jerry Doniger, Montvale, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 7, 1973, Ser. No. 422,824
Int. Cl. B64c *13/50*
U.S. Cl. 244—77 M **5 Claims**



1. A fail operative control system, comprising:

means for providing a first signal corresponding to a condition;

means for providing a second redundant signal corresponding to the condition;

means for providing a reference signal;

means for combining the first signal and the reference signal and for providing a first error signal;

means for combining the second signal and the reference signal and for providing a second error signal;

means for providing a signal corresponding to the rate of change of the condition;

averaging means connected to both of said combining means and to the condition rate signal means and responsive to the first and second error signals and the rate signal for providing an output signal corresponding to the average of the acceptable error and rate signals and for eliminating those of said signals which differ from the average by a predetermined amount;

integrating means connected to the means for providing a signal corresponding to the rate of change of the condition for integrating the signal therefrom and for providing a signal as a pseudo-condition reference;

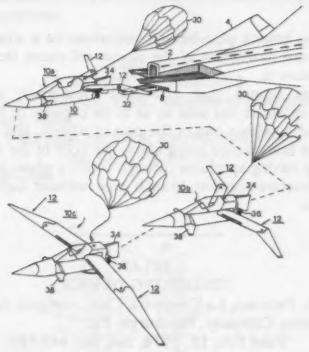
averaging means connected to both of said combining means and to the integrating means and responsive to the first and second error signals and the pseudo-condition reference signal for providing the output signal corresponding to the average of the acceptable error and pseudo-condition reference signals and for eliminating those of said signals which differ from the average by a predetermined amount and means connected to the last mentioned means and responsive to the output signal therefrom for controlling the condition.

3,881,671

DETACHABLE CABIN AIRCRAFT

Joseph Bouchnik, Moshav Mismeret, Gush Tel Mond, Israel

Filed Apr. 23, 1973, Ser. No. 353,842
Claims priority, application Israel, Apr. 21, 1972, 39260
Int. Cl. B64d *25/08*
U.S. Cl. 244—140 **8 Claims**



1. An aircraft comprising a main delta-wing section and a pilot's cabin section forwardly of the main delta-wing section, said pilot's cabin section being detachable from the main delta-wing section and including a pair of auxiliary wings substantially coplanar with the main delta-wing section and pivotably mounted about a vertical axis of the aircraft, said auxiliary wings being pivoted from a retracted position when the cabin section is attached to the main delta-wing section, to a deployed position when the cabin section is detached from the main delta-wing section, said auxiliary wings in the retracted position being pivoted rearwardly and forming the apex and leading edge of the main delta-wing section, said auxiliary wings in the deployed position being pivoted forwardly and providing an increased glider wing surface for the detached cabin section.

3,881,672

RAILWAY TRAIN INCLUDING EMERGENCY BRAKING APPARATUS

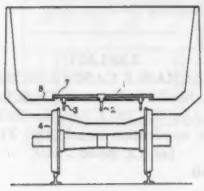
Roland Gittard, Nouadhibou, Mauritania, assignor to Societe Anonyme des Mines de Fer de Mauritania, F'derik, Mauritania

Filed Jan. 14, 1974, Ser. No. 433,230
Claims priority, application Malagasy Republic, Nov. 28, 1973, 55071
Int. Cl. B61l *3/00*
U.S. Cl. 246—172 **9 Claims**

1. In an apparatus for braking a railway train having at least one wagon, a body of the wagon including a floor, a pair of wheels, an axle extending between and connected to the pair of wheels, a common train pipe and the wagon having a brake

controlled by the pressure in the train pipe, the improvement comprising

at least one branch pipe connected to said train pipe and so located adjacent a wheel of said wagon as to be engaged and fractured by the wheel if the latter shifts abnormally in relation to the body of said wagon, thereby altering the pressure in said train pipe applying said brakes throughout the train,



the one branch pipe being situated above a wheel so that upward movement of the wheel will cause the wheel to fracture it,

the one branch pipe extending transversely across the wagon above the axle so as to be capable of being fractured by either one of the pair of wheels, and

the one branch pipe being above the floor of the wagon, the floor having apertures through which a wheel can project to fracture the one branch pipe without damaging the floor.

3,881,673

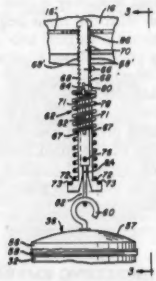
TENSIONING DEVICE

Harley G. Peterson, La Crescenta, Calif., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 15, 1974, Ser. No. 442,752

Int. Cl. B01d *46/06*

U.S. Cl. 248—94 **9 Claims**



1. An elongated retaining device comprising: a body member having one end portion thereof adapted to support a supported member therefrom and having an outwardly biased bifurcated portion adjacent the other end portion thereof; and each of the legs of said bifurcated portion including retaining means extending longitudinally therealong which are adapted to be cooperable with a seating portion of a supporting member to selectively retain said body member at any of a plurality of locations therealong with respect to such a seating portion by overcoming the bias of said bifurcated portion and seating a selected section of said retaining means on such a seating portion.

3,881,674

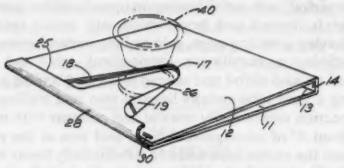
FLOWER DELIVERY HOLDER

Oliver Watson Greene, III, 101 Glen Rock Rd., West Kingston, R.I. 02892

Filed Mar. 13, 1974, Ser. No. 450,569

Int. Cl. A47g *7/00, 23/02, 29/00*

U.S. Cl. 248—152 **4 Claims**



1. A floral holder comprising a blank having a base portion and a top wall portion, at least one fold line separating said portions, the top wall portion being foldable over the base portion about the fold line, the top wall portion having a free end with a V recess medially thereof, the bottom wall having a free end with a tongue, a fold line adjacent the tongue, said tongue being folded about its adjacent fold line and received in the V recess juxtaposed to the bottom wall.

3,881,675

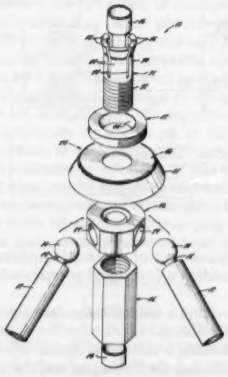
CAMERA TRIPOD

John C. Matchett, 2851 Rolling Hills Dr., Space No. 79, Fullerton, Calif. 92635

Filed Jan. 4, 1974, Ser. No. 430,799

Int. Cl. F16m *11/38*

U.S. Cl. 248—170 **6 Claims**



1. A tripod comprising:

a plurality of elongate legs, each of said legs terminating in a ball at the upper end thereof;

an elongate column including a camera-connecting fitting at one end thereof; and

central platform means receiving and supporting said upper ends of said legs and receiving and supporting for movement in an axial direction said elongate column, said platform means including:

a collet surrounding said elongate column and having an externally threaded lower end and a slotted upper end, said collet further having a tapered, increased-thickness upper end;

a generally cylindrical trunnion surrounding a central portion of said collet and having a plurality of recesses in the outer surface thereof for receipt of portions of said balls; a disc-shaped cap surrounding said collet, above said trunnion, and extending radially outwardly and then angularly downwardly to contact said balls on the sides thereof opposite from said recesses in said trunnion;

a cylindrical collar surrounding said collet, between said upper end thereof and said cap, said collar having a tapered inside surface which is identical to and engages the tapered upper end of said collet; and

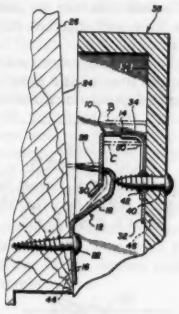
a nut surrounding said collet, below said trunnion, and engaging the external threads thereon whereby tightening of said nut relative to said collet simultaneously urges said trunnion towards said cap, tightening said balls at said upper ends of said legs between said trunnion and said cap to lock said legs to said trunnion and forces said upper end of said collet into said collar thereby tightening said slotted upper end of said collet around said column to lock said column to said collet.

3,881,676

SHUTTER MOUNTING CLIP

Ernest W. Reinwall, McHenry, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 17, 1973, Ser. No. 351,834
Int. Cl. F16m *13/00*
U.S. Cl. 248—224 **4 Claims**



1. Mounting means for hanging a structure subject to expansion and contraction on a wall comprising: a first member having a first section secured to said structure and a second section projecting outwardly from said first section and provided with a depending tongue including a major dependent portion, a second member having a first section secured to said wall and a resilient second section which is shaped in the form of a reverse bend and is provided with a free end portion which contains a slot that receives said tongue for sliding movement therein and which reverse bend is stressed outwardly relative to the first section of said second member away from the wall under influence of the assembled tongue therewith so that it resiliently urges said structure toward said wall when said structure is hung irrespective of expansion and contraction of said structure as the tongue slides in the slot.

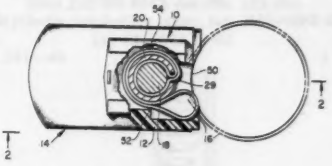
3,881,677

RECEPTACLE MOUNTING MEANS

Francis J. Ihlenfeld, West Seneca, N.Y., assignor to McDonald Products Corporation, Buffalo, N.Y.

Filed July 13, 1973, Ser. No. 379,088
Int. Cl. A47c *7/70*; F16m *13/00*; A47k *1/08*
U.S. Cl. 248—311 **13 Claims**

1. Mounting means for releasably securing a receptacle to a tubular support member comprising: a body having a clip portion and a receptacle engaging portion; said receptacle engaging portion being joined to said clip portion in a diverging relation thereto; said body being selectively invertable; said clip portion being adapted for snap fit attachment to a tubular support member in either position; said receptacle



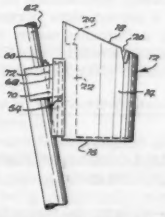
engaging portion having means for detachably mounting a receptacle to said body in either position whereby said receptacle can be mounted on tubular support members of various angles of inclination to position said receptacle in a generally upward disposition.

3,881,678

ATTACHING APPARATUS

Peter T. Quinn, Littleton, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed June 28, 1973, Ser. No. 374,572
Int. Cl. A47g *29/122*
U.S. Cl. 248—360 **1 Claim**

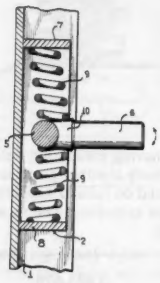


1. An attachment element for including a housing mounting on a support member, comprising a rotatable shaft and a sleeve that encompasses said shaft, said shaft and sleeve being positioned within said housing and mounted for joint frictional rotational movement on said housing, said sleeve being in spaced apart relationship with said shaft, the side of said sleeve and said housing having walls that form openings therein, a resilient band in the form of an elongated closed loop, a first portion of said loop being positioned in loose captured relationship between the outer wall of said shaft and the inner wall of said sleeve, portions of said loop that extend away from said first portion forming two adjacent folded portions thereof, said folded portions being positioned to extend through and beyond said openings in said sleeve and said housing to a position whereat said folded portion may be separated to embrace the support member to which the housing is to be attached, a gripping means connected to at least one end of said shaft and positioned immediately adjacent the exterior of said housing, said rotation of said gripping means in one direction being operable to wind a portion of said loop that extends away from its said first portion in folded form about the outside surface of said sleeve and to thereby simultaneously effect the pulling of said housing into snug mounted engagement against said support member, said gripping means being further operable to rotate said shaft and sleeve in an opposite direction to unwind said folded band portions from said sleeve to a position in which said band is in a loose, readily removable position about said support.

3,881,679
PRESSURE GUIDE FOR USE IN DITCH SUPPORTING ASSEMBLY

Josef Krings, Hans-Bockler-Str. 23, Oberbruch, Germany

Filed June 28, 1973, Ser. No. 374,462
Claims priority, application Germany, Aug. 4, 1972, 7228864; Apr. 10, 1973, 2317872
Int. Cl. E21d 5/00
U.S. Cl. 248—356 8 Claims

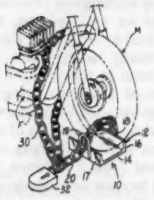


1. A pressure guide for positioning at opposite ends of a tensioning device extending between a pair of aligned vertical supporting posts of a bracing assembly, said pressure guide comprising frame means constructed for mounting on a supporting post, a terminal piece for a tensioning device, pivot means mounting said terminal piece at right angles to the general plane of said frame intermediate the ends thereof for limited movement in a second plane normal to said general plane, and elastically deformable means between opposite ends of said frame and said terminal piece for resisting pivotal movement of said terminal piece from said right angle position.

3,881,680
CYCLE LOCKING SYSTEM

Robert J. Lietaert, Jr., 27545 Wyly Dr., Mount Clemens, Mich. 48043

Filed Apr. 5, 1974, Ser. No. 458,310
Int. Cl. E05b 71/00
U.S. Cl. 248—499 6 Claims

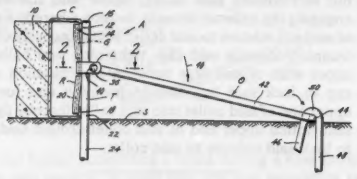


1. Improvement in a cycle locking system for locking a cycle having a cycle locking device having a base member in the form of a doubly opened ended wheel cradle having opposite upstanding side walls and means for fastening said cradle to concrete or the like, said device having a cycle-fastening chain made fast to one of said side walls, said improvement comprising eyelet means on the other of said side walls, said eyelet means and said cycle-fastening chain being so related that the diameter of said eyelet means is greater than that of said chain so that the latter can thread through said cycle and then through said eyelet means from inside to outside thereof and extend beyond said eyelet means so that the said free end thereof is capable of serving as an anchoring means for locking thereto a second cycle-fastening chain, whereby to lock said cycle to said locking device.

3,881,681
FORM ANCHOR

Daniel O. Sumpter, and Don R. Rodriguez, both of P. O. Box 305, Channelview, Tex. 77530

Filed Aug. 22, 1973, Ser. No. 390,488
Int. Cl. B28b 7/00
U.S. Cl. 249—3 9 Claims



1. An apparatus for anchoring a pouring form, having a forming surface and upper and lower mounting rims formed therewith defining a central opening between them, on a surface for concrete pouring and the like, comprising:

a. gripping means insertable in the central opening of the form, said gripping means having means therewith for releasably engaging the mounting rims of the form for releasably gripping the form; and

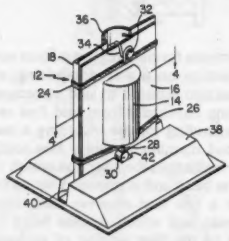
b. stake means for insertion into the surface at a position external of the form and adjacent said gripping means; and

c. means for moving said gripping means into position gripping the mounting rims of the form against said stake means, wherein the form is anchored to the surface.

3,881,682
CANDLE MOLD

Henry Kin, 11442 Southland Rd., Forest Park, Ohio 45240

Filed Aug. 3, 1973, Ser. No. 385,283
Int. Cl. B29d 31/00
U.S. Cl. 249—94 4 Claims

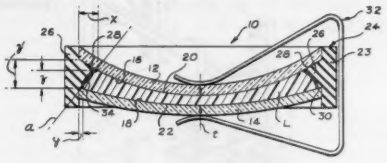


1. A candle mold comprising a plurality of sides, said sides cooperating with one another to define a candle form therebetween, the periphery of said sides having complementally formed flange and flange-receiving grooves respectively therealong wherein said flange and grooves cooperatively engage each other in interlocking fashion when said sides are placed together, a wick receiving chamber and slot formed in one side of one mold side adjacent one end thereof, said chamber and slot opening to the inside of the mold, securing means on the outside of said one side of the mold adjaacent the other end thereof wherein one end of a wick is placed in said chamber and the other end of said wick is secured to said securing means whereby the wick is centered in the resulting candle, and spout means in the other mold side to permit pouring of hot wax into the mold.

3,881,683
GASKET FOR LENS MOLD

Donald B. Whitney, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 29, 1973, Ser. No. 420,031
Int. Cl. B29c 1/00; B29d 11/00
U.S. Cl. 249—117 4 Claims



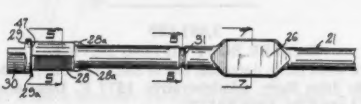
1. In a lens casting mold including a pair of mold halves, one of said pair having a convex surface for molding concave ocular surfaces of lenses and the other of said pair having a concave surface for molding convex object side surfaces of the lenses and a resilient annular gasket for supporting said convex and concave surfaces of said mold halves in a predetermined spaced coaxially aligned relationship, the improvement comprising:

said gasket having an inwardly directed flange providing a seat for one of said mold halves at each of its opposite sides and said flange having an inclined inner rectilinear casting face of a concavely obtusely angled configuration along its extension from one of said seats to the other of said seats, said inclined casting face providing said one of said seats with an appreciably greater width than the other, said one seat of greater width being concavely shaped for receiving said convex molding surface of said one mold half and minimizing the area of contact between said convex molding surface and the ocular surfaces of lenses cast thereby and said other seat of lesser width being convexly shaped for receiving said concave molding surface of said other mold half and maximizing the diametral size of the convex object side surfaces of lenses cast thereby.

3,881,684
TIE ROD FOR CONCRETE FORMS

Ransom J. Daniels, Jr., 93 Brookhaven Drive, Glastonbury, Conn. 06033

Division of Ser. No. 141,576, May 10, 1971, Pat. No. 3,746,297. This application Jan. 26, 1973, Ser. No. 326,598
Int. Cl. E04g 17/06
U.S. Cl. 249—214 4 Claims

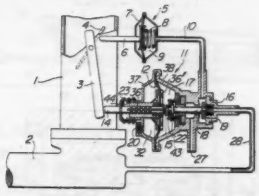


1. A tie rod for concrete forms comprising a length of wire of predetermined diameter having adjacent each end thereof a length of substantially square cross-section outwardly subtended by an annular flange, said flanges being integral with said rod, said flanges being of greater diameter than the diameter of said wire and at least as great as the cross-section diagonal of said square length whereby said flanges provide surfaces extending outwardly from each edge of said square section.

3,881,685
DEVICE FOR CONTROLLING THE CLOSURE OF CARBURETOR BUTTERFLY VALVE

Masaru Hase, Toyota; Shinya Ishihara; Mikio Maki, both of Anjo, and Kiyohiko Mizuno, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd. and Toyota Jidosha Kogyo Kabushiki Kaisha, Kariya-shi, Japan

Filed July 27, 1973, Ser. No. 383,054
Claims priority, application Japan, July 31, 1972, 47-77161
Int. Cl. F02d 11/08
U.S. Cl. 251—48 3 Claims



1. A device for controlling the closure of a carburetor butterfly valve of an engine by controlling the pivotal movement thereof comprising:

a lever secured to said butterfly valve and being pivotally movable therewith;

a positioner means for limiting the closure of said butterfly valve, said positioning means including a pressure chamber, a diaphragm positioned within said chamber, said diaphragm being reciprocally movable in response to fluid pressure differential in said chamber, and a stopper connected to said diaphragm and being movable between a first closure limiting position and a second closure position, said stopper when in said first closure limiting position limiting the closure of said butterfly valve, and when in said second closure position permitting the complete closure of said butterfly valve; and

a dash pot, said dash pot including a main shaft, a sub-shaft having one end communicating with said main shaft through a first spring means with the other end thereof being biased toward said main shaft by a second spring means, said lever forcing said main shaft against said first spring means when said lever is rotated beyond a predetermined angle in a first butterfly opening direction, said sub-shaft being moved in response to the movement of said main shaft against the bias of said second spring means, a change-over valve mounted to said sub-shaft and being operable to vary the fluid pressure differential in said pressure chamber in response to the movement of said sub-shaft wherein said stopper is moved to said first closure limiting position only when said butterfly valve and said lever is rotated beyond said predetermined angle, means for retarding the reverse movement of said main shaft when said butterfly valve is closed after having been rotated beyond said predetermined angle, said butterfly valve being limited by said stopper for a predetermined time related to the retarding movement time of said main shaft to thereby maintain said butterfly valve at an open angle greater than the closure angle thereof.

3,881,686

VALVE ASSEMBLY

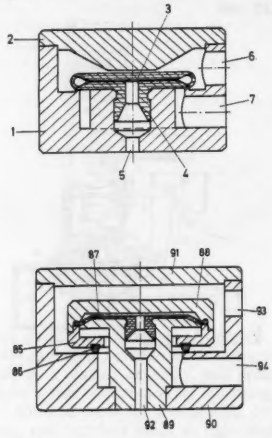
Georg Hirmann, Zurich, Switzerland, assignor to Rudolf Felix Homberger, Schaffhausen and Kurt Meyer, Olten, both of, Switzerland

Filed Aug. 17, 1973, Ser. No. 389,137

Claims priority, application Switzerland, Aug. 24, 1972, 12046/72; Aug. 24, 1972, 12047/72

Int. Cl. F15k *31/12*

U.S. Cl. 251—61.1 **8 Claims**



1. A valve assembly comprising a casing having a valve seat therein, inlet and outlet connections communicating through said seat, a valve within said casing being disposed between said inlet and outlet connections for engagement with and displacement from said seat, said valve comprising a pair of leaf members peripherally joined together, at least one of said leaf members being flexibly deformable and defining with the other leaf member an inpervous inflatable chamber, said valve in its relaxed state with said chamber deflated engaging the valve seat and thus closing the valve seat, a control conduit communicating through one of said leaf members with said inflatable chamber, said control conduit being offset from said inlet and outlet, a source of inflating fluid, and means for introducing an inflating fluid under pressure from said source through said conduit into said chamber, whereby the chamber is inflated and the flexible leaf is thereby deformed to displace the valve from the valve seat and thus open the valve seat.

3,881,687

METHOD AND APPARATUS FOR LIFTING LOADS STEP-BY-STEP, ESPECIALLY HEAVY LOADS

Dag Valdemar Henry Johansson, Breviada 8033, S-541 00 Skovde, Sweden

Filed Apr. 27, 1973, Ser. No. 354,936

Claims priority, application Sweden, May 4, 1972, 5885/72

Int. Cl. B66f *1/08*

U.S. Cl. 254—1 **11 Claims**

1. A device for lifting loads in stages comprising

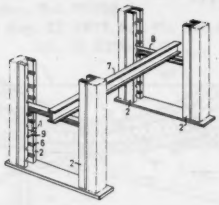
at least one jack having a base portion and an extendable and retractable lifting portion,

a carrying structure for said jack having two opposing side walls spaced from each other and defining a jack receiving channel therebetween, said side walls having inside surfaces,

first and second jack supporting means each extending across the channel between the opposing side walls to alternately support said base portion and said lifting portion of said jack respectively, and

a plurality of generally horizontal abutment surfaces disposed in the opposing side walls and spaced along the length of said carrying structure,

said plurality of abutment surfaces being inclined downwards from the inside surfaces in the opposing side walls,



portions of said jack supporting means selectively engaging and co-acting with said abutment surfaces in the opposing side walls and having an equivalent chamfer to match said inclined abutment surfaces to support said jack centrally within the jack receiving channel of said carrying structure and free from contact therewith.

3,881,688

APPARATUS FOR APPLYING VISCOUS MASSES

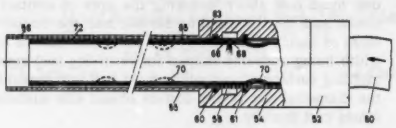
Georg Senn, Mutschellen, Switzerland, assignor to Spribag Aktiengesellschaft, CH-8967 Widen-Mutschellen, Switzerland

Filed Feb. 23, 1972, Ser. No. 228,584

Claims priority, application Switzerland, Mar. 4, 1971, 3177/71; Jan. 21, 1972, 884/72

Int. Cl. B01f *5/20*

U.S. Cl. 259—4 **18 Claims**



1. Apparatus for continuously mixing and applying a viscous mass to an object, comprising a rigid tube, a flexible hose located co-axially within said tube, said flexible hose being secured to said tube at its rear end and extending substantially freely along the length of said tube radially spaced from the inner wall thereof, means for pneumatically feeding particulate material axially to the rear end of said flexible hose, said flexible hose being swingable and radially distendable under the flow of said material toward its forward end.

3,881,689

CAMPER BODY LIFTING DEVICE

Richard Reed Bury, deceased, late of Salt Lake City, Utah, and Linda John Bury, administratrix, 1577 E. Delaware Ln., Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 311,320, Dec. 1, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,800

Int. Cl. B66f *7/26*

U.S. Cl. 254—45 **10 Claims**

1. A device for lifting camper bodies onto and off a truck bed comprising:

a. a substantially rectangular support member for encompassing a camper body which includes:

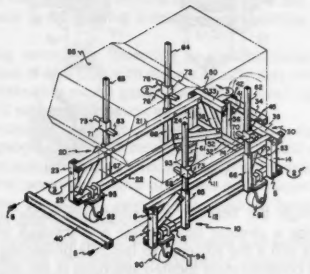
1. a pair of elongated side frames,

2. a front connecting member detachably fixed to the front sections of said side frames, and

3. a rear frame detachably connected to the rear sections of said side frames, said rear frame including a locking arm pivotally mounted at one of its ends to permit entrance into said camper body;

b. wheeled means mounted at each lower corner of said support member to permit movement of said support member over a ground surface;

c. a wheel locking means operatively carried by said support member;



d. vertical lifting means mounted at or near each of the corners of said support member, said vertical lifting means being adapted for independent lifting action;

e. opposed brackets having a protective covering mounted to each of the lifting means for engaging and supporting the undersections of a camper body at or near its corners; and

f. means for actuating said lifting device.

3,881,690

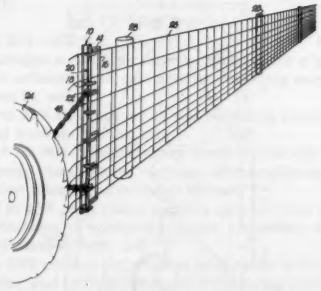
FENCE STRETCHER

James E. Combs, Jr., P.O. Box 81, Farley, Mo. 64028

Filed Feb. 21, 1974, Ser. No. 444,416

Int. Cl. B66f *19/00*

U.S. Cl. 254—83 **6 Claims**



4. In a fence stretcher having an elongated base, a number of projections secured to the base, an elongated, rotatable cam extending longitudinally of the base between the latter and the projections, and a force transmitting means for interconnecting said cam to a draft source, wherein the improvement comprises:

providing said cam with a pair of opposed, transversely arcuate, longitudinally extending, outermost faces, one on each side respectively of its longitudinal axis, with one of said faces offset in one direction relative to said axis and the other of said faces offset in the opposite direction relative to said axis whereby, when the fence is between the cam and said base, rotation of the cam in one direction will clamp the fence against the base with progressively increased force as said one face slides along the projections and said other face slides along the fence,

said cam being provided with a pair of diametrically opposed, oppositely facing, flat lands coextensive in length therewith,

said lands intersecting said faces to form opposite extremities.

3,881,691

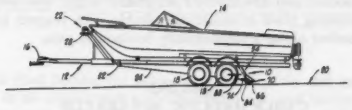
ROLL UNDER JACK FOR ELEVATING A FRAME

Eugene D. Colclasure, 519 Campbell, Ardmore, Okla. 73401

Filed Nov. 7, 1973, Ser. No. 413,433

Int. Cl. B66f *7/22*

U.S. Cl. 254—94 **6 Claims**



1. A jack for elevating a frame a distance above the ground, comprising:

a jack body having an upper end engageable with a portion of the frame in a jacking position and a lower end;

a wheel rollingly secured to the lower end of the jack body;

means, having a portion attachable to a portion of the jack body, for pulling the jack body in a jacking direction generally toward a vertical position beneath the frame, the jack body being rollingly supported via the wheel and elevating the frame while being pulled in a jacking direction in an engaging position of the upper end of the jack body and a portion of the frame, the frame being elevated via a distance generally corresponding to the height of the jack between the upper end of the jack body and the wheel and the angular position of the jack body in a jacking position thereof; and

means, having a portion secured to the jack body, limiting the movement of the jack body in a jacking direction and positioning the jack body in a predetermined jacking position beneath the frame, said means including a stop flange secured to the jack body and having a ground engaging portion engageable with the ground in a jacking position of the jack body, the stop flange engaging the ground and limiting the movement of the jack body in a jacking direction positioning the jack body in a jacking position beneath the frame.

3,881,692

RESILIENTLY TILTABLE VEHICLE JACK BASE

Bernard S. Clarke, Orillia, Ontario, Canada, assignor to Seeburn Metal Products Limited, Beaverton, Ontario, Canada

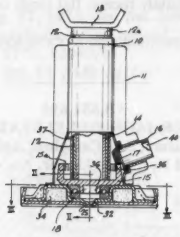
Filed June 21, 1974, Ser. No. 481,771

Int. Cl. B66f *13/00*

U.S. Cl. 254—101 **5 Claims**

1. A resiliently tiltable load supporting base for vehicle jacks, comprising (a) a rectangular metallic base member having a substantially flat bottom with upturned peripheral edges and a rounded ridge extending along a central axis thereof, said ridge being bifurcated at a central region to form a central dish-shaped depression in said bottom, (b) a metallic load receiving plate having a substantially flat top with downturned peripheral edges terminating in a narrow peripheral flange, said flange having downwardly directed, rounded projections in mid-points of opposite ends, said projections being adapted to rest on said base member ridge and a socket extending downwardly in a central region of said top, said socket being adapted to receive a jack tube and having in the bottom thereof a downwardly directed rounded projection which mates with said dish-shaped depression in the base member

and (c) elastomeric slab means mounted between said base member and load receiving plate in a region between the



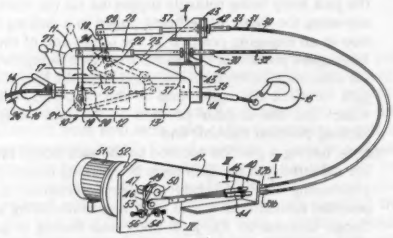
central socket and downturned peripheral edges, whereby the load receiving plate is resiliently tiltable with respect to the base member along a substantially horizontal axis.

3,881,693

CABLE HAULING APPARATUS

Johannes A. Rinio, Odenthal, Germany, assignor to Greifzug GmbH, Bergisch-Gladbach, Germany

Filed May 7, 1973, Ser. No. 358,050
Claims priority, application Germany, May 16, 1972, 2223743; Mar. 7, 1973, 2311148
Int. Cl. B66d *3/00*
U.S. Cl. 254—135 R **22 Claims**



1. A cable hauling apparatus comprising clamp jaws mounted in two blocks that are movable in opposite directions, the jaws clamping alternately on a cable pulled through the apparatus and taking this cable along as they move, two pivoted operating levers, each being drivingly connected to both said blocks to move said blocks in said opposite directions: the improvement consisting in that both operating levers are connected through a crank drive to a rotary drive, said operating levers being connected with their crank drive at such an angle α in an offset relationship to each other with the rotary drive that in each of the two directions of rotation of the rotary drive in each case one of the two operating levers leads the other lever with such an interval that only the leading operating lever produces an effect over the clamp jaws connected thereto while the other operating lever is taken along loosely.

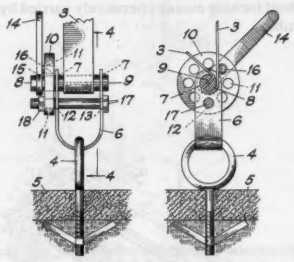
3,881,694

TIGHTENING SPINDLE FOR MOBILE HOMES

Elmer W. Gardner, General Delivery, Graysville, Tenn. 37338

Filed Aug. 27, 1973, Ser. No. 391,607
Int. Cl. B66f *13/00*
U.S. Cl. 254—164 **1 Claim**

1. A device for tightening and holding an inflexible metal band securing a movable object in a fixed position relative to the ground comprising a U-shaped bracket having aligned first and second pairs of holes through its sides and secured to an anchor fastened in the ground, a rotatable spindle slotted to receive the band and journaled in said first pair of aligned holes in the bracket, a circular disc fixed to the spindle outside of the bracket having a series of concentrically located apertures through it in selective alignment with said second pair of



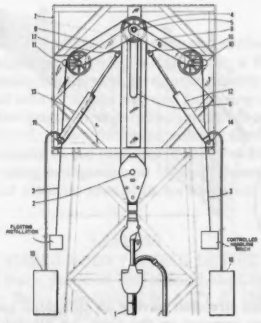
holes through the bracket, a readily detachable tightening lever having a circular hole at one end through which the spindle fits and a lug adjacent to the hole projecting through one of the concentrically located apertures in the disc to wind continuously the band around the spindle and tighten it and means for locking the disc and spindle in tightened position.

3,881,695

DEVICE FOR MEASURING THE RATE OF PENETRATION OF THE DRILL BIT DURING DRILLING OPERATIONS PERFORMED FROM A FLOATING INSTALLATION

Philippe Joubert, Meudon La Foret, France, assignor to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Nov. 7, 1972, Ser. No. 304,414
Claims priority, application France, Nov. 8, 1971, 71.40041
Int. Cl. B66d *1/48*
U.S. Cl. 254—172 **11 Claims**



1. A device for measuring drilling speeds of a drill pipe subject to relative movement with respect to a drilling installation, said device comprising:

first signal means for generating a first signal representative of the position of a drill pipe with respect to the drilling installation;

second signal means connected to said first signal means for deriving from said first signal a second signal representa-

tive of drilling speeds of said drill pipe, said second signal being a first derivative of said first signal; and

diplay means connected to said second signal means for displaying said second signal such that said drilling speeds are obtained.

8. A device for measuring drilling speeds of drill pipe from a floating drilling installation of the type including an apparatus for preventing drill pipe from vertical movements, said apparatus including a support member for supporting drill pipe, control means for controlling displacement of said drill pipe relative to said floating installation, and compensating means for compensating vertical movements of the drill pipe with respect to the floating installation, said device comprising:

detecting means for detecting an instantaneous relative position of drill pipe with respect to a floating installation, said detecting means generating a first signal representative of said instantaneous position,

first processing means for processing said first signal, said first processing means being connected to said detecting means and generating a second signal representative of a relative position of said drill pipe with respect to said floating installation, said relative position being a function of said instantaneous position,

second processing means for processing said second signal, said second processing means being connected to said first processing means and generating a third signal representative of a relative speed of advancement of said drill pipe with respect to said floating installation, and

display means for displaying values of drilling speed, said display means being connected to said second processing means.

3,881,696

CATALYST FOR CLEANING ENGINE EXHAUST GASES

Jean-Michel Lepeytre, Tarbes; Claude Paul; Louis Grandet, both of Toulouse, and Louis Minjolle, Tarbes, all of France, assignors to Azote et Produits Chimiques, S.A., Toulouse and Ceraver, Paris, both of, France

Filed Feb. 23, 1973, Ser. No. 335,125

Claims priority, application France, Feb. 23, 1972, 72.06018

Int. Cl. B01j *11/06, 11/22*

U.S. Cl. 252—455 R **11 Claims**

1. A catalyst suitable for reducing the content of pollutants in engine exhaust gases, said catalyst consisting essentially of in percent by weight:

a. 80 to 95% of a ceramic carrier consisting essentially of a fired intimate mixture of:

i. 55 to 98% of a refractory member selected from the group consisting of alumina, aluminosilicate, magnesium silicate and mixtures thereof,

ii. 2 to 45% of a catalyst member selected from the group consisting of manganese oxide, chromium oxide and mixtures thereof; and

b. 5 to 20% catalyst components lying on the surface of said carrier, said cat: lyst components consisting essentially of:

i. 0.025 to 1% of platinum

ii. 50 to 99.975% of a metal oxide selected from the group consisting of nickel oxide, cobalt oxide, iron oxide and mixtures thereof; and

iii. 0 to 49% of manganese oxide, chromium oxide and mixtures thereof,

said refractory catalyst member and on an overall basis consisting essentially of in percent by weight:

40–90% of said refractory member to 40% of manganese oxide, chromium oxide, or mixtures thereof,

0.005 to 0.05% of platinum, and

5 to 20% of nickel oxide, cobalt oxide, iron oxide or mixtures thereof.

3,881,697

ROADSIDE SAFETY APPARATUS

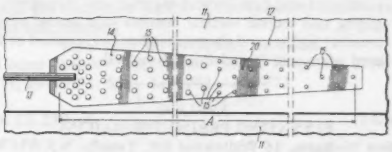
Ernest Glaesener, Dudelange, Luxembourg, assignor to ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg

Filed Oct. 19, 1973, Ser. No. 407,998

Claims priority, application Germany, Oct. 21, 1972, 2251749

Int. Cl. E01f *15/00*

U.S. Cl. 256—13.1 **18 Claims**



1. A road barrier for protection of a vehicle and its occupants in an impact with a stationary object, said barrier comprising a support base widening in the direction of said object, and a correspondingly widening array of a multiplicity of upright elongated impact-absorbing bendable elements having lower ends mounted on said support base and each consisting of an upright bar having a lower end sunk into said support and extending below the grounds, said bars having free upper ends and being of generally continuous cross section throughout their length and being arrayed so as to provide a greater cross-sectional density per unit of surface area close to said object than remote therefrom, said bars being spaced apart and staggered along said support base, the number of bars per unit ground area being greater close to said object than remote therefrom.

3,881,698

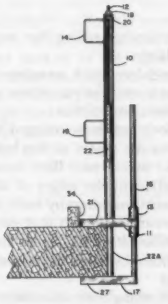
SAFETY HANDRAIL SUPPORT

Jimmy R. Marsh, 1116 Nassau Dr., Las Vegas, Nev. 89108

Filed June 21, 1974, Ser. No. 481,836

Int. Cl. E04h *17/18*

U.S. Cl. 256—59 **7 Claims**



1. A safety guardrail support apparatus comprising:

a first hollow vertical member having means attached thereto for supporting a handrail,

a first clamp member secured to said first vertical member adjacent the lower end thereof,

an upper reinforcing assembly comprising a first rigid arm having one end attached to said first vertical member adjacent the lower end opposite said first clamp member and a sleeve member secured on the other end of said first arm,

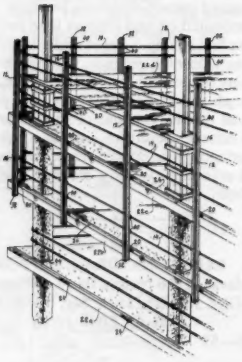
a second hollow vertical member movably received in said first vertical member,

a second clamp member secured to said second vertical member adjacent the lower end thereof,

a lower reinforcing assembly comprising a second rigid arm having one end attached to said second vertical member adjacent the lower end thereof opposite said second clamp member and a brace member secured on the other end of said second arm and extending through said sleeve of said upper reinforcing assembly, and

a threaded rod extending interiorly along at least the upper portion of said first vertical member and threadedly engaging said second vertical member said second vertical member and second clamp member being raised or lowered when said threaded rod is turned.

3,881,699
ELEVATING PERIMETER RAILING
Arthur Nusbaum, 16 Whitewood Rd., Tenafly, N.J. 07670
Filed Apr. 15, 1974, Ser. No. 461,230
Int. Cl. E04h *17/14*
U.S. Cl. 256—59 **5 Claims**



1. A temporary perimeter railing for multi-story building construction, comprising:

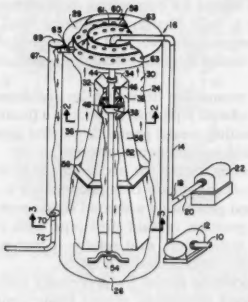
a. a plurality of stanchions, each stanchion being of a length at least sufficient to extend past three adjacent floors of the building under construction;

b. a plurality of floor brackets adapted to slidably secure said stanchions to the floors of the building under construction, at least two of said floor brackets being vertically disposed adjacent the edges of adjacent floors for each of said stanchions whereby each stanchion is vertically slidably constrained such that each stanchion may be raised to extend above an upper floor and to be secured by said floor brackets disposed on at least two lower floors; and

c. safety guards extending from stanchion to stanchion and secured thereto.

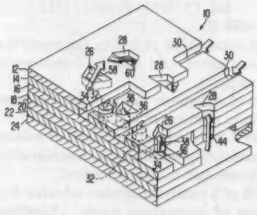
3,881,700
WATER TREATMENT PLANT
Bert C. Bradford, Society St., St. George, S.C. 29477
Filed Nov. 8, 1973, Ser. No. 413,859
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **5 Claims**

1. An apparatus for ensuring mixing of a solution of water with chemicals to produce a more purified mixture comprising: a cylindrical upright vertical tank having a side wall with a top and bottom thereon; a conduit extending through the top of said tank conveying said solution to said tank; a hood carried within said vertical tank; said hood having an upper portion with diverging walls extending downwardly from the bottom of said upper portion; said diverging walls terminating adjacent and above the bottom of said tank with the bottom of said diverging walls being spaced from said side wall of said tank; a cup-shaped member carried in said upper portion of



said hood having a bottom and walls extending upwardly therefrom; said conduit terminating in said cup-shaped member, holes provided in said conduit adjacent said bottom of said cup-shaped member for discharging said solution into said cup-shaped member to collide with said cup-shaped member for reversing the direction of flow of said solution creating water turbulence in said upper portion of said hood; whereby additional mixing of said chemical and water takes place in said hood form producing a more purified mixture.

3,881,701
FLUID MIXER REACTOR
Leonard Schoenman, Citrus Heights, and Robert C. Schindler, Fair Oaks, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
Filed Sept. 17, 1973, Ser. No. 398,031
Int. Cl. B01f *5/02, 5/18*
U.S. Cl. 259—4 **15 Claims**

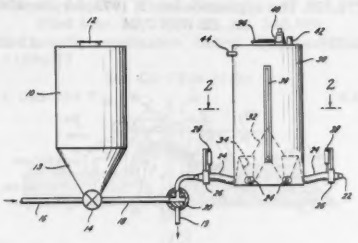


1. A fluid mixing device comprising: a plurality of relatively thin plates arranged in a stack to form a platelet assembly, one of the plates being at the end of the stack and provided with an outlet opening, the plate next adjacent to said end plate having an elongated channel for receiving a first fluid and for placing the latter in heat exchange relationship to the end plate, said assembly having first passage means coupled with the channel for directing the first fluid from the latter to said opening, a second passage means for directing a second fluid into mixing relationship to the first fluid, and means defined by said passage means and employing the kinetic energy of the flowing fluid for atomizing at least one of the fluids as it flows through said assembly and prior to its being mixed with the other fluid.

3,881,702
BLENDER

Donald James McIver, Houston, Tex., assignor to Keystone International, Inc., Houston, Harris County, Tex.

Continuation of Ser. No. 242,010, April 7, 1972, abandoned. This application Oct. 12, 1973, Ser. No. 406,012
Int. Cl. B01f 5/04
U.S. Cl. 259—4 **11 Claims**



1. Apparatus for blending a plurality of diverse dry pulverulent materials, comprising

a pressure tight container having a plurality of hoppers forming its bottom, and

means for injecting fluidized dry pulverulent material into the bottom of each hopper, said plurality of hoppers comprising

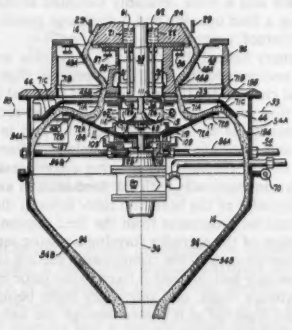
a central cone having its base substantially at the bottom of the container and

means including the cone and the surrounding will of the container defining a plurality of upwardly diverging fluid passageways having one of said means for injecting material in communication with the lower end of each said passageway.

3,881,703
FOUNDRY MIXING MACHINE

Edward John Rebish, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 305,839, Nov. 13, 1972, Pat. No. 3,850,413, which is a continuation-in-part of Ser. No. 211,925, Dec. 27, 1971, Pat. No. 3,773,229. This application Nov. 19, 1973, Ser. No. 416,948
Int. Cl. B01f 5/24
U.S. Cl. 259—4 **13 Claims**



1. A foundry machine for mixing a mold material component and a binder component, comprising in combination:

a mixer for dispersing first and second binder components, said mixer dispersing the first binder component in a geometric direction;

means for supplying the binder component to said mixer;

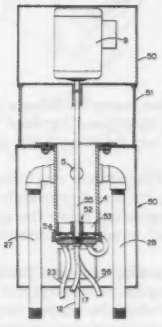
means for establishing the mold material component to traverse said geometric direction to mix with the binder component and to subsequently traverse said geometric direction to enable additional mixing thereby,

said separator means in said mixer to maintain separate said first and second binder components.

3,881,704
WATER TREATMENT APPARATUS

Fred Smith, Norwich, England, assignor to Lord Mayor, Alderman and Citizens of the City of Norwich, City Hall, Norwich, Norfolk, England

Filed June 13, 1972, Ser. No. 262,379
Claims priority, application United Kingdom, June 24, 1971, 29737/71; Mar. 23, 1972, 13644/72
Int. Cl. B01f 7/22
U.S. Cl. 259—8 **7 Claims**



1. Apparatus comprising a mixing chamber which is an upright cylindrical vessel, at least three separate inlets which lead non-axially into the bottom of the vessel, said inlets being positioned substantially uniformly around the bottom of the vessel at a distance of from about one half to seven eighths of the radius of the bottom of the vessel from the axis of the vessel, an outlet duct leading from the vessel near its top, a hydraulic ejector to which the outlet duct leads, and means for mixing under high shear within the vessel material introduced through the inlets, said mixing means being from 0.5 to 6 mm from the bottom of the vessel between the inlets and the outlet.

3,881,705
BLENDER ADAPTOR

Robert P. Greenspan, P.O. Box 112, Huntingdon Valley, Pa. 19006

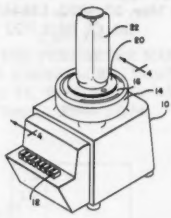
Filed June 20, 1973, Ser. No. 371,894
Int. Cl. B01p 8/1
U.S. Cl. 259—108 **4 Claims**

1. In a blender adaptor suitable to mount a laboratory bottle having a narrow, threaded neck upon a blender base which is equipped with a jar mounting attachment having a floor and a relatively wide diameter, internally threaded section positioned above the floor, the combination of

A. an adaptor ring having the configuration of an annular ring including a top and a generally planar bottom and defining an inside diameter face and an outside diameter face,

1. said inside diameter face being provided with internal threads,
2. said internal threads being of suitable diameter and pitch to threadedly engage the said narrow bottle, threaded neck,
3. said outside diameter face being provided with external threads,
4. said external threads being of suitable diameter and pitch to threadedly engage the said relatively wide diameter internally threaded of said jar mounting attachment section and

B. connection means between the adaptor ring and the jar mounting attachment to provide a leakproof connection therebetween,



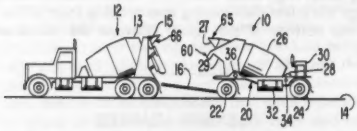
1. said connection means including a resilient gasket, said gasket being interposed between the bottom of the adaptor ring and the floor of the jar mounting attachment,
2. the bottom of the adaptor ring being formed to provide a depending, circular downwardly facing sealing lip,
   a. said lip depending below the general plane of the bottom and terminating downwardly in a sealing surface,
   b. the entire sealing surface of the lip pressing into and compressing the resilient gasket to provide a leakproof seal when the adaptor ring is threadedly engaged into the jar mounting attachment.

3,881,706

TRAILER HAVING CONCRETE MIXER THEREON

William C. Mohrmann, 1030 - 35th Ave., Santa Cruz, Calif. 95060

Filed June 28, 1973, Ser. No. 374,739
Int. Cl. B28c *5/28*
U.S. Cl. 259—162 **6 Claims**



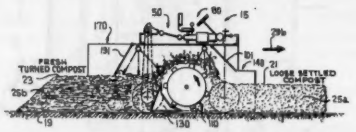
1. A concrete hauling unit comprising: a truck having a concrete mixer mounted thereon for rotation about a first inclined axis and provided with an opening near the rear end thereof for permitting concrete to be received therein; a trailer having a concrete mixer mounted thereon and rotatable relative thereto about a second inclined axis, the mixer on the trailer having an opening near the front end thereof for permitting concrete to be removed therefrom and being pivotal relative to the trailer from a lowered, stabilized position to an upper position at which the opening thereof is in alignment with the opening of the mixer of the truck, whereby concrete can be transferred therebetween, means on the trailer for rotating the mixer thereof, and means carried by the trailer for raising and lowering the last-mentioned mixer; and means releasably interconnecting the truck and the trailer.

3,881,707

SCOOP MEANS AND ARRANGEMENTS THEREOF FOR VEHICULAR COMPOSTING MACHINE

Louis R. Toto, Box 78, Penn Green Rd., Landenberg, Pa. 19350

Continuation-in-part of Ser. No. 241,129, April 5, 1972, Pat. No. 3,776,528. This application Dec. 3, 1973, Ser. No. 420,865
Int. Cl. B01f *7/04*
U.S. Cl. 259—183 **13 Claims**



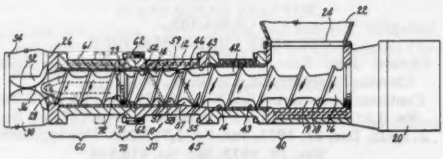
1. In a vehicular composting machine, a scoop means, for liftingly detaching clumps from an upstanding endwise wall of a compacted rick, having a compaction control means which comprises a pressure means and a dewatering means for selectively densifying and dewatering said detached clumps during impact and curvilinear acceleration thereof.

3,881,708

MIXING EXTRUDERS

George E. Carle, Derby, Conn., assignor to USM Corporation, Boston, Mass.

Filed June 15, 1972, Ser. No. 263,118
Int. Cl. B29b *1/10*
U.S. Cl. 259—191 **1 Claim**



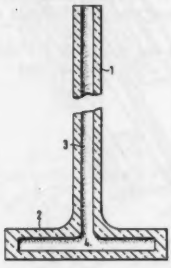
1. A mixing extruder for the processing of rubber, plastics and like materials having a housing with a generally cylindrical bore therein and a rotor rotatably mounted in the bore, the bore having a feed opening and a discharge opening at opposite ends thereof, comprising:
   a. a primary helical flight fixed to said rotor and substantially coextensive therewith, said primary flight forming a helical channel for the movement of material in the bore;
   b. a portion of the extruder forming a feed section which communicates with the feed opening and in which the bore and rotor are of relatively enlarged diameter;
   c. a portion of the extruder forming a compression section which communicates with the feed section and in which the diameter of the bore and rotor linearly diminishes as the material progresses from the feed section;
   d. a portion of the extruder forming a mixing section which communicates with the compression section and in which a secondary helical flight is fixed to the rotor intermediate the primary flight, said secondary flight being shaped to mix the material as it passes through the helical channel of the primary flight;
   e. a portion of the extruder forming a shearing section which communicates with the mixing section and in which a shear collar is removably secured to the rotor to create a shearing force on the material as it progresses through the channel of the primary flight; and

f. a portion of the extruder forming a discharge section which communicates with the shearing section and with the discharge opening and which is of sufficient length to avoid the transmission of back pressures through the extruder.

3,881,709
DIFFUSER CASTINGS

William John Steen, Wirral, England, assignor to Morgan Refractories Limited, Wirral, England

Filed Mar. 12, 1973, Ser. No. 340,199
Claims priority, application United Kingdom, Mar. 13, 1972, 11590/72
Int. Cl. C22b 21/06
U.S. Cl. 266—34 T 6 Claims

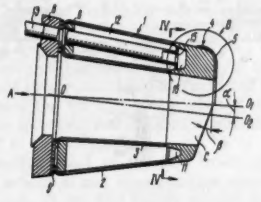


1. A diffuser for feeding gas into molten aluminum or other fluid material at high temperatures, comprising a cast refractory having a tubular inlet stem integral with a hollow, gas-permeable outlet head which extends sharply laterally from the stem and has an unbroken wall around a cavity extending from the bore of the inlet stem, said gas-permeable outlet head being an integrally cast branch of said tubular inlet stem, and said unbroken wall being constituted by as-cast refractory surfaces devoid of joints or joined refractory components or like discontinuities.

3,881,710
BLAST-FURNACE TUYERE

Lev Dmitrievich Jupko, prospekt Lenina, 232, kv. 48, Zaporozhie, U.S.S.R.

Filed Mar. 14, 1974, Ser. No. 451,155
Int. Cl. C21b 7/16
U.S. Cl. 266—41 2 Claims

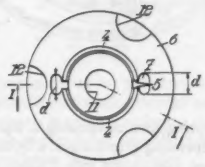


1. A blast-furnace tuyere comprising: a closed, hollow, annular housing; a transverse annular partition dividing the annular space of the housing into a head portion (adjoining the melting chamber of the furnace) and a tail portion; a coolant inlet opening and a coolant outlet opening provided in the end of said housing tail portion; a coolant inlet opening provided at the top of said transverse annular partition and a coolant outlet opening provided at the bottom thereof; a coolant supply pipe fitting through said inlet opening in the end of the housing tail portion, passing longitudinally through said housing tail portion and fitting into said housing head portion through said inlet opening in the transverse annular partition; said pipe supplying coolant into the housing head portion from where it passes through said outlet opening in the transverse annular partition into the housing tail portion and thence flows away through said outlet hole in the end of the housing tail portion; a longitudinal partition mounted in the housing head portion so as to divide said inlet opening in the transverse partition into two parts for the coolant entering the housing head portion through said supply pipe to be divided into two streams, which streams simultaneously pass over the walls of the two halves of the housing head portion to cool them and subsequently join at said outlet opening in the transverse partition, the coolant flow passing into the housing tail portion through this opening.

3,881,711
ELASTIC SUPPORTS

Jean-Claude Lemaitre, Verneuil, Seine, France, assignor to Paulstra, Levallois-Perret, France

Filed Jan. 3, 1974, Ser. No. 430,387
Claims priority, application France, Jan. 12, 1973, 73.01135
Int. Cl. F16f 1/16
U.S. Cl. 267—57.1 R 8 Claims

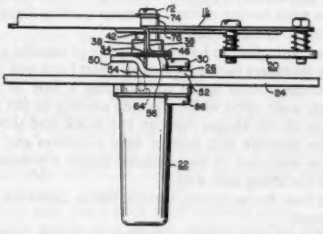


1. Elastic support of the type comprising at least one rubber cushion between two tubular reinforcements or coaxial bushes, the inner bush being in at least two elements spaced from one another on mounting by a central mandrel so as to provide a separation between the edges of said elements, the major portion of the cross-section of the elastic cushion facing the respective edges of the two elements of the inner bush defining gaps whose cross-section extends, in the tangential direction, over a distance of the order of two to three times the separation between said edges.

3,881,712
DAMPER MECHANISM

Paul T. Metzger, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

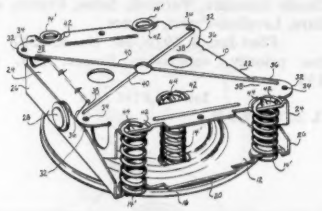
Filed Jan. 11, 1974, Ser. No. 432,520
Int. Cl. F16f 1/16
U.S. Cl. 267—154 14 Claims



1. A damper comprising:

a rigid housing formed with a cavity and an opening to the cavity;
a fluid contained within the cavity;
a post extending through the opening into the fluid in the cavity, and
a flexible seal extending from the opening in said enclosure supporting said post in said fluid, said flexible seal providing a pivot for controlling the pivotal movement of the post within the cavity.

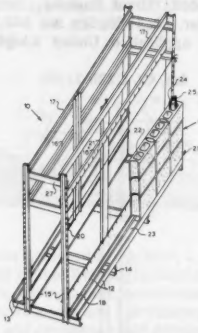
3,881,713
ROCKER SPRING UNIT
T. Bob Joyce, Mansfield, Ark., assignor to Hickory Springs Manufacturing Company, Hickory, N.C.
Filed May 23, 1973, Ser. No. 363,032
Int. Cl. F16f *3/04*
U.S. Cl. 267—131 **8 Claims**



1. In a rocker spring unit comprising a top plate member having opposed depending side flanges, a bottom plate member having opposed upstanding side flanges extending into face-to-face relation to said top plate member side flanges, means pivotally connecting said top plate member side flanges to said bottom plate member side flanges at a centrally disposed horizontal pivot axis, rocker springs extended between and attached to said plate members, and bosses displaced in said plate members adjacent front and rear edge portions thereof to form attaching seats for said rocker springs, the improvement which comprises angled seat portions in said bosses adjacent said rear edge portion of said top plate member, said seat portions being angled downwardly and forwardly for straight line bottoming of the rocker springs attached thereto upon downward rocking of said top plate member rear edge portion.

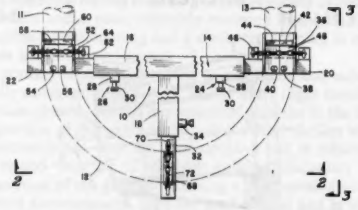
3,881,714
APPARATUS FOR BUILDING CONCRETE BLOCK WALLS
John A. Wilnau, P.O. Box 1308, Orlando, Fla. 32802
Filed Nov. 16, 1973, Ser. No. 416,359
Int. Cl. E04g *21/18, 21/22*
U.S. Cl. 269—13 **1 Claim**

1. An apparatus for manufacturing concrete block walls upon, the walls having vertical openings passing therethrough, comprising in combination:
a. base frame portion having two pairs of parallel elongated base members each pair spaced apart from end to end by an unobstructed space for building a pair of concrete block walls upon while allowing cement to fall from the inside of the blocks through the block and through the space between said pair of base members and allowing lifting members to be extended under a portion of said wall for lifting said wall;
b. said base frame having vertical frame members attached thereto;
c. said base frame having horizontal frame members attached to said vertical frame members and providing support for said vertical members, at least two horizontal support members acting as ground support members supporting said pairs of parallel elongated base members to provide space there=between when said apparatus is placed upon a surface, the base frame providing an unobstructed slot under the central area of the walls for most of the length of the walls;
d. spacing marks located on at least two vertical frame members to locate a levelling line between for aligning tiers of concrete block wall;



e. said spacing marks on said vertical frame members having means for attaching a line at predetermined points on said vertical frame members, and said vertical frame members being spaced to mark the most common wall lengths; and
f. at least one horizontal frame member having markings thereon for locating the length of a wall section being built upon said apparatus whereby a concrete block wall can be built upon said apparatus and removed for transportation and anchoring to a foundation for forming the walls of a building.

3,881,715
FIXTURE FOR HOLDING TUBE TURNS
Ellis E. Creek, 1100 North Sixth, Broken Arrow, Okla. 74012
Filed Sept. 7, 1973, Ser. No. 395,369
Int. Cl. B25b *1/20, 11/02*
U.S. Cl. 269—45 **5 Claims**



1. A fixture for holding tube turns during "fix up" prior to welding thereof to complementary tube means and comprising support bracket means, longitudinally adjustable substantially V-shaped tube receiving means secured to the support bracket means for receiving the tube means therein, clamping means secured to the tube receiving means for clamping the tube receiving means to the tube means therein, longitudinally adjustable substantially V-shaped tube turn receiving means secured to the support bracket means and cooperating with the tube receiving means for supporting the tube turn with the opposite ends thereof simultaneously in end to end abutment

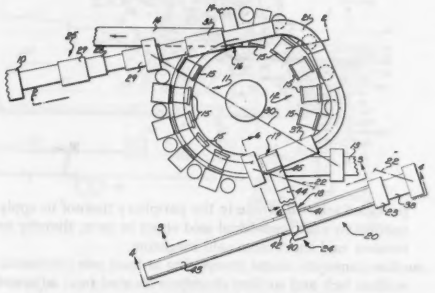
with the tube means, and clamping means provided on the tube turn receiving means for clamping the tube turn on the apparatus in said abutting relationship with the tube means, each of said V-shaped tube receiving members having shim members provided in the proximity of one end thereof for receiving a tube thereagainst, and each of said V-shaped tube receiving members having adjusting means provided at the opposite end thereof for engagement with the tube turn for adjusting the relative position thereof with respect to the respective tube member disposed in said V-shaped tube receiving member.

3,881,716

COMBINED NEWSPAPER PRESS AND STUFFER, AND METHOD OF FORMING NEWSPAPERS THEREWITH

Robert Andrew Bryson, and James C. Wise, both of Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Feb. 17, 1972, Ser. No. 227,184
Int. Cl. B41f *13/64*
U.S. Cl. 270—12 **18 Claims**



1. A method of associating sheet material articles in a continuous operation by freshly printing first selected sheet material articles and assembling at least one of the first articles with a second preprinted sheet material article, said method comprising the steps of:

printing and conveying first sheet material articles in an overlapped, shingled stream along a first path,

forming a stack of said first sheet material articles at a first station,

feeding the first sheet material articles individually from the stack at said first station to a continuous conveyor and conveying it toward a first delivery station,

combining a second preprinted sheet material article with the freshly-printed first sheet material article while being conveyed toward the first delivery station,

diverting first freshly-printed sheet material articles in the overlapped stream out of said first path and into a second path, conveying the first freshly-printed sheet material articles in an overlapped shingled stream along said second path to a second station,

forming another stack of the first freshly-printed sheet material articles at said second station whenever an adequate supply of the first freshly-printed sheet material articles exists at said first station,

feeding the first sheet material articles individually from the other stack at said second station to a continuous conveyor and conveying it toward a second delivery station, combining a second preprinted sheet material article with the freshly-printed sheet material article while being conveyed to said second delivery station, and

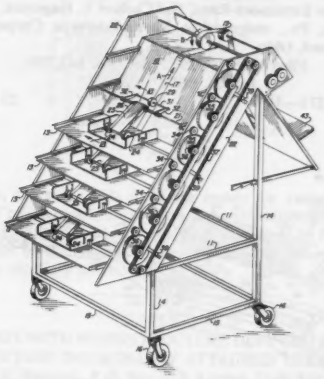
alternating the conveying of the first freshly-printed sheet material articles along said first and second paths as required to maintain an adequate supply of the first freshly-printed sheet material articles in the respective stacks at said first and second stations.

3,881,717

PAPER SHEET DISPENSER

Bonnie L. Dean, Lexington, Ky., assignor to Grable Printing Co., Lexington, Ky.

Filed Oct. 1, 1973, Ser. No. 402,040
Int. Cl. B65h *31/02*
U.S. Cl. 270—58 **2 Claims**



1. In a collating machine for withdrawing single sheets of paper from a plurality of stacks thereof and for assembling said withdrawn sheets in registry to form a plurality of packets, the sheets in each packet being assembled in a predetermined sequence, said collating machine having

a frame,

a plurality of paper stack storage stations mounted on said frame,

dispensing roller means associated with each storage station for periodically dispensing single sheets of paper from the forward end thereof,

an activating mechanism carried by said frame for sequentially driving each of said dispensing roller means to dispense said single sheets forwardly from said storage stations in a predetermined sequence,

conveyor means on said frame for gathering said single sheets of paper sequentially dispensed forwardly from said storage stations and assembling them into said packets, and

power means to drive said activating mechanism and conveyor means,

the improved dispensing roller means and activating mechanism therefor, comprising, in combination:

a. a rotatable shaft journaled in said frame and supported transversely and spaced above each said storage station;

b. a dispensing-roller support member depending rearwardly from said rotatable shaft, said shaft being journaled for rotation within the upper end of said support member;

c. a belt-driven free-wheeling dispensing roller rotatably mounted on the bottom end of said support member, positioned to continuously bear upon the top sheet of paper in the paper stack in said storage station;

d. driving belt means for periodically driving said dispensing roller in a rotational direction to pull said top sheet forwardly from said stack and dispense it forwardly from said storage station, in response to periodic rotation of said transverse rotatable shaft;

e. a driven gear fixed upon said rotatable shaft;

f. rotatable sector gear means carried on said frame, the teeth of which are engageable with said driven gear on said rotatable shaft, to periodically rotate said shaft in response to continuous rotation of said sector gear means;

g. sprocket gear means coaxially rotatable with said sector gear means; and

h. drive chain means carried on said frame, engageable with said sprocket gear means and continuously driven by said power means.

3,881,718

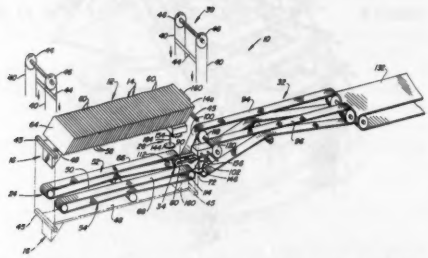
UNSTACKING AND SHINGLING OF SHEET MATERIAL ARTICLES

Victoriano Fernandez-Rana, and Carlton V. Hageman, both of Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 19, 1973, Ser. No. 342,739

Int. Cl. B65h *1/02, 3/32*

U.S. Cl. 271—10 **25 Claims**



1. An apparatus for receiving an on-edge series of folded sheet material articles from a support tray and for moving the sheet material articles into an overlapping stream, said apparatus comprising first conveyor means for receiving the series of sheet material articles in an on-edge orientation from the tray and for moving the series of sheet material articles forwardly with first end portions of the sheet material articles uppermost, said first conveyor means including first surface means for engaging second end portions of the sheet material articles disposed opposite from the first end portions of the sheet material articles and for supporting the sheet material articles in an on-edge orientation with side surfaces of the articles disposed in abutting engagement, means for engaging a forwardmost article in the series of sheet material articles at a location intermediate its end portions to hold the series of sheet material articles in an on-edge orientation and for sequentially separating a forwardmost sheet material article from the series, and second conveyor means for receiving each of the released sheet material articles in turn from said first conveyor means and for transporting the sheet material articles in an overlapped stream with the first end portions of adjacent sheet material articles spaced apart and the first end portions of the sheet material articles leading their respective second end portions, said second conveyor means including second surface means for engaging the side surfaces of the sheet material articles and supporting them in an overlapped relationship.

3,881,719

SHEET FEEDING ARRANGEMENT

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Oct. 26, 1973, Ser. No. 410,158

Claims priority, application United Kingdom, Oct. 31, 1972, 50092/72

Int. Cl. B65h *5/08*

U.S. Cl. 271—12 **4 Claims**

1. A sheet processing device comprising, in combination:

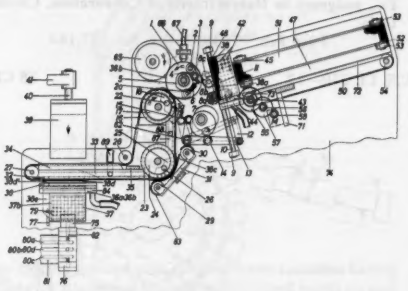
an elongate storage magazine for storing a plurality of individual sheets of wrapping material with their adjacent flat faces in contact;

mounting means for mounting said magazine with the elongate dimension thereof inclined at a small angle to the horizontal and thereby to position said magazine with one end portion thereof at a lower level than the respective other end portion thereof;

frictionally operative means to act against at least one edge of each sheet for urging said sheets towards said lower end portion of said magazine;

orifice means disposed next adjacent said lower end portion, whereby compressed gas may be applied through said orifice means to loosen sheets located in said lower end portion of said magazine;

a rotary suction device to remove successive single ones of said sheets from said magazine, said rotary suction device comprising at least one suction roller rotably mounted on a slidable carriage, said carriage being mounted to be rectilinearly reciprocatable, said suction roller being



provided with an orifice in the periphery thereof to apply suction to each individual said sheet in turn, thereby to remove said sheet from said magazine;

suction conveyor means comprising at least one permeable endless belt and suction chambers located next adjacent one surface of said permeable belt to apply suction to sheets through said permeable belt thereby to maintain said sheets in contact with the surface of said permeable belt opposite to said one surface thereof, said permeable belt being constrained into a generally L-shaped configuration and being displaceable to convey said sheets successively removed from said storage magazine by said rotary suction device along at least part of a sheet path; and

a gripper cylinder to transfer said sheets from said rotary suction device to said suction conveyor means.

3,881,720

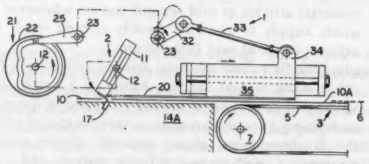
GRIPLESS SHEET GUIDING APPARATUS

James A. Benzing, Hamilton, Ohio, assignor to Champion International Corporation, Hamilton, Ohio

Continuation of Ser. No. 343,309, March 21, 1973, abandoned. This application Feb. 14, 1974, Ser. No. 442,322

Int. Cl. B65h *7/00;* **B23d** *25/16*

U.S. Cl. 271—63 **10 Claims**



1. A non-gripping sheet feeding means for receiving a sheet from an infeed device such as a cutter or the like having sheet feeding means and guiding it to an outfeed device such as a

layboy or the like having an infeed conveying means, and which comprises:

a fixed horizontal table member extending substantially between said infeed and outfeed devices for serving as a bottom guide or sheet support;

a reciprocatable non-gripping sheet guide; and

means for supporting and reciprocably moving said sheet guide in a path substantially parallel to and above said table member and to and from between said infeed and outfeed devices in timed relationship to at least one of said devices;

said sheet being fed from said infeed device between said table member and said sheet guide, thence to said outfeed device.

3,881,721

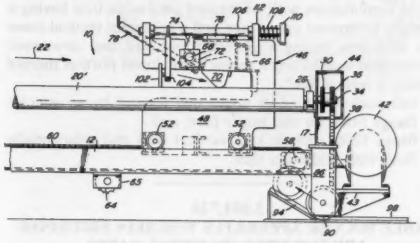
SHEET TAKE OFF APPARATUS

Thomas R. Hitch, Aldan, Pa., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed Jan. 28, 1974, Ser. No. 437,124

Int. Cl. B65h *29/20*

U.S. Cl. 271—184 **12 Claims**



1. Apparatus for handling sheets discharged successively from a processing machine comprising a transfer conveyor for conveying sheets in a first horizontal direction, a carriage, means supported by said carriage above the elevation of the conveyor for arresting the motion of discharged sheets, means supporting the carriage for movement in a second horizontal direction which is substantially perpendicular to said first direction, and means for moving said arresting means in said second direction while simultaneously changing the elevation of both said arresting means and said conveyor.

3,881,722

SHEET DELIVERY ARRANGEMENT FOR PRINTING PRESSES

Friedrich Preuss, Sprendlingen, Germany, assignor to Roland Offsetmaschinenfabrik Faber and Schleicher AG

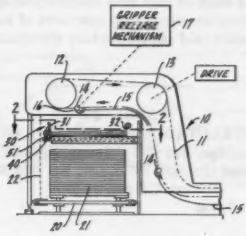
Filed June 11, 1974, Ser. No. 478,304

Claims priority, application Germany, June 12, 1973, 2329767

Int. Cl. B65h *31/32*

U.S. Cl. 271—218 **3 Claims**

1. A sheet delivery arrangement for sheet-fed printing presses comprising, in combination, a frame, a delivery platform mounted in the frame, a conveyor for conveying sheets seriatim from the printing press and for depositing them one by one upon the delivery platform to form a pile, horizontally spaced front edge and rear edge sheet guides mounted in the frame below the conveyor for arresting forward movement and for positioning the sheets as the sheets fall from the conveyor onto the platform to form a uniform pile on the platform, means for lowering the platform as the pile builds up, a pair of horizontal guide rails on the frame, said guide rails being spaced outwardly from and a short distance below the sheet guides and serving to support an auxiliary pile board which is inserted into the descending stream of sheets passing through the sheet guides for temporarily intercepting and accumulating such sheets thereby permitting removal of a filled delivery platform and substitution of an empty delivery



platform, the guide rails including means for camming the auxiliary pile board upwardly into close proximity to the rear edge sheet guides incident to the final portion of its insertion movement so that sheets are deposited in accurate position upon the auxiliary pile board.

3,881,723

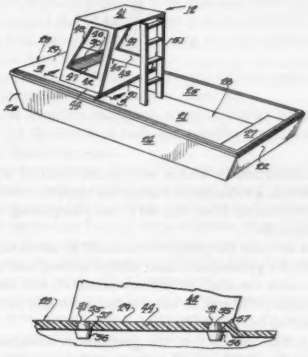
SANDBOX WITH SUPERSTRUCTURE DEFINING A PLAY STRUCTURE DETACHABLY ATTACHED THERETO

Vaughn E. Boynton, P.O. Box 423, Layton, Utah 84041

Filed Jan. 7, 1974, Ser. No. 431,573

Int. Cl. A63g *31/00*

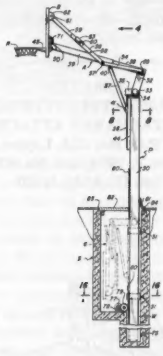
U.S. Cl. 272—1 A **8 Claims**



1. A super sandbox comprising a basic shell base having a horizontal bottom surface, upright back and front wall surfaces, and upright opposed side wall surfaces, said surfaces defining therebetween a compartment adapted to contain a layer of sand therein; a substantially horizontal platform permanently affixed to the top edges of said opposed side wall surfaces at the front end portion of the shell base in a manner extending transversely of the shell base and overlying said compartment defined therein; a plurality of spaced apart apertures defined in said platform and extending vertically therethrough; a superstructure adapted to be detachably attached to said basic shell base and project above the horizontal platform thereof in a manner defining a play structure for children to use in conjunction with the sandbox of the basic shell base, said superstructure consisting of a housing of any desired size and configuration having a top member, side wall

members depending downwardly from the top member and terminating in bottom edges, said bottom edges lying coplanar at opposite sides of said housing and adapted to rest said housing on said horizontal platform, each of said terminal edges provided with boss members projecting downwardly therefrom and each of said boss members adapted to be detachably received in one of said apertures of said platform to detachably retain said superstructure mounted on said platform.

3,881,724
RETRACTABLE BASKETBALL GOAL
James F. Beveridge, Box 491, Ulysses, Kans. 67880
Filed Oct. 19, 1973, Ser. No. 408,581
Int. Cl. A63b *63/04*
U.S. Cl. 273—1.5 R **14 Claims**



7. In combination with a well in the floor of a gymnasium or like arena, a retractable basketball structure mounted upon a post extendable from the well and comprising in combination therewith:

means to raise the post from a shaft of the well to upstand from the gymnasium floor above the well and to lower the post into the shaft to retract the same, said shaft being of a depth sufficient to receive the post and permit it to be lowered below the floor;

a pocket in the floor of the gymnasium alongside and contiguous with the shaft to receive the goal structure when the post is lowered into the well whereby the post and goal structure will be below the gymnasium floor when the same is at its retracted position;

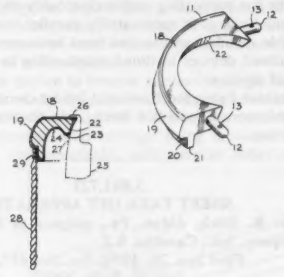
a telescoping arm pivotally mounted on the upper end of said post;

a backstop and a goal ring pivotally mounted at the end of said arm;

means extending and retracting said arm and moving said arm between a telescoped retracted position along side said post and an extended position extending from the end of said post; and

means for pivoting said backstop and goal ring about the end of said arm is extended or retracted, in order to position said backstop in an upright position and said goal ring in a horizontal position when said arm is fully extended and to position said backstop and goal ring in a folded position against said arm when said arm is retracted to a position alongside said post.

3,881,725
POOL IRON AND POOL TABLE POCKET THEREFOR
Raul Rubalcava, 3218 W. Teranimar, Anaheim, Calif. 92804
Filed Jan. 4, 1973, Ser. No. 320,887
Int. Cl. A63d *15/00*
U.S. Cl. 273—12 **4 Claims**

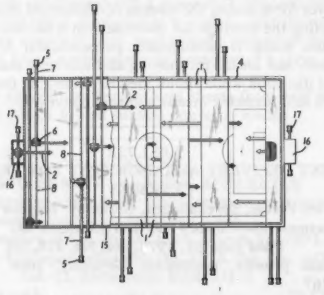


1. In combination with an arcuate pool table iron having a generally horizontal upper face and a generally vertical inner face, said iron having a generally outward and downward curved outer face having a recess in the lower portion thereof forming a vertical wall;

a ball pocket having its upper end formed by an annular flange fitted on said upper face; and

a fringe fitted against said vertical wall and substantially flush with said outer face.

3,881,726
TABLE SOCCER APPARATUS WHEREIN FIGURINES ARE MOUNTED ON METAL TAPES
Glauco Serafini, Via Pippo Tamburri 4, Rome, Italy
Filed Dec. 28, 1973, Ser. No. 429,684
Claims priority, application Italy, Jan. 3, 1973, 47509/73
Int. Cl. A63f *7/05*
U.S. Cl. 273—85 F **5 Claims**



1. A mechanical miniature table soccer game for playing a game of miniature soccer comprising, means defining a miniature soccer playing field, actuation means mounting a plurality of miniature soccer players individually in positions for playing in respective zones, said actuation means comprising a plurality of individually manually actuated actuators spaced between the goals of said playing field and underlying the playing field, guide means mounting the actuators individually for movement transversely of the playing field and rotationally, each actuator having a coilable tape movable forwardly longitudinally and backwardly relative to said goals in a corresponding one of said zones on said playing field and movable transversely thereof, a plurality of figurines defining said soc-

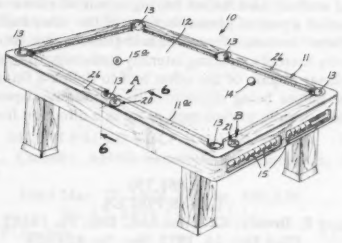
cer players each mounted on the free end portion of a corresponding one of the tapes for movement forwardly and rearwardly and transversely of a corresponding zone, and a playing ball kicked and thrown by the individual players when actuated by the respective actuators and tapes.

3,881,727

MARKING DISC FOR POOL GAMES

Michael L. Olson, 34 Pines Edge Mobile Pk., Eau Claire, Wis. 54701

Filed Sept. 17, 1973, Ser. No. 397,888
Int. Cl. A63d *15/00*
U.S. Cl. 273—14 2 Claims



1. A pool table including a set of balls for playing the game of pool and a pair of markers for indicating given positions relative to the peripheral edge of the pool table, in combination, comprising:

a. said pool table having a playing surface, a plurality of pockets positioned at spaced points peripherally of the playing surface, and a peripheral edge portion surrounding the playing surface;

b. said set of balls including a first group of pool balls provided with indicia of a first design on the surface of each pool ball thereof to designate said first group as the solid color group and a second group of pool balls provided with indicia of a second design on the surface of each pool ball thereof different from said indicia of said first group of pool balls to designate said second group as the striped color group;

c. said pair of markers comprising a pair of relatively thin plate-like body members each having opposite surface areas;

d. retainer means associated with one of said opposite surface areas of each body member for maintaining the position of said body members at a given location on said peripheral edge of the pool table;

e. identification means associated with the other of said opposite surface areas of each body member for differentiating one of said body members from the other of said body members;

f. the identifcation means of one body member simulating the design of said first group of pool balls;

g. the identification means of the other body member simulating the design of said second group of pool balls; and

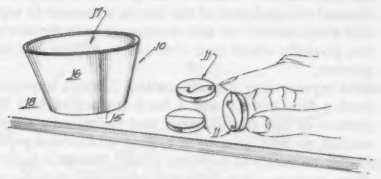
h. said retainer means of each body member having a relatively thin thickness dimension substantially equal to that of respective body members whereby said body members and respective retainer means cooperate to present a relatively low profile when supported on the peripheral edge of the pool table.

3,881,728

MATHEMATICAL TIDDLY-WINK APPARATUS

Emerson F. Martyn, 1807 Prospect St., LaSalle, Ill. 61301

Filed May 13, 1974, Ser. No. 469,336
Int. Cl. A63b *71/02*
U.S. Cl. 273—95 E 1 Claim



1. An add and multiply in a wink game of the tiddly-wink type comprising, in combination:

a receptacle of an inverted truncated conical configuration having a flat bottom surface, an open top surface, and conical side walls;

a compartment defined interiorly of said side walls above said bottom surface and having access thereto through said open top end of said receptacle;

a plurality of identically shaped and configured sets of flat circular disc members, each set of disc members having a like number of disc members provided therein;

each of said sets of disc members are of a different color to clearly differentiate the sets from each other to distinguish the set of one player from the set of any other player;

each of said disc members consisting of a first member and a second member which is pivotally connected to said first member and movable relative thereto between a closed position defining with said first member a circular flat shaped disc, and an open position pivoted away from said first member and exposing an otherwise hidden portion of said first member;

said first and second members being defined generally along a diametric line of said disc member;

said first member including a semi-circular section having the full thickness of said disc member and terminating at said diametric edge;

said hidden portion of said first member formed integrally with said semi-circular section and being of a lesser thickness than said first section and a lesser diameter than said first section to form a semi-circular projection disposed within the plane of said first section having its base formed at said diametric edge of said first section and projecting outwardly therefrom;

said second member being of a semi-circular configuration and terminating along a diametric edge disposed in abutting juxtaposition with said diametric edge of said first member when said second member is in the closed position;

said second member provided interiorly thereof with a semi-circular recess opening out of said diametric edge, said recess lying in the plane of said first member hidden portion and being of a size and configuration to completely receive said semi-circular hidden portion of said first member therein to completely cover the same when said second member is in a closed position relative to said first member;

a rivet extending through adjacent corner edges of said second member and said hidden portion of said first member to pivotally join said first and said second members together for relative rotation thereabout between said disc open position and said disc closed position;

a diagonally outwardly projecting flange member formed integrally with said first section of said first member along the diametric edge thereof on both sides thereof and projecting outwardly therefrom and co-planar with said

diametric edge in a manner to overlie a segment of said hidden portion;

a complementary shaped recess extending diagonally into said second member from each of said diametric edges thereof and adapted to be brought into registration with said diagonal projection to engage the same for retaining the disc member in said closed position while permitting manual manipulation of the disc in a manner to separate said projections from said recesses to open the disc member pivotally about said rivet pin to expose said hidden portion;

indicia representing a mathematical formula imprinted on both a face surface and a back surface of said hidden portion of said first member and visibly only when said second member is open to expose said hidden portion;

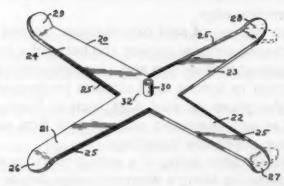
said disc members of each set of disc members having the same mathematical formulas imprinted thereon as the disc members of each other set of disc members so that each player is provided with a set of disc members having the same set of mathematical formula indicia thereon;

whereby said disc members in the closed position may be slipped into said receptacle and then opened for the player to solve the mathematical formula thereon, after which the disc members may again be closed for later use thereof in a manner not adversely effecting or destroying said disc member.

3,881,729
FLYING TOY

Milton L. Block, 68 N. Main St., Sellersville, Pa. 18950; David D. Goldberg, 1032 Bloomfield Ave., Philadelphia, Pa. 19115, and Kenneth S. Douthit, 5130 Butler Pk., Plymouth Meeting, Pa. 19462

Filed Jan. 9, 1974, Ser. No. 431,681
Int. Cl. A63b *65/08;* **A63h** *27/00*
U.S. Cl. 273—106 D **11 Claims**



1. A flying toy comprising in combination,

a. a hub provided with an air permeable aerodynamic resistance comprising a cylindrical tube affixed to and extending orthogonally upward from the top surface of said hub, the tubular central bore being extended through the said hub from the top surface to the bottom surface thereof, whereby a controlled flow of air is passable therethrough when said toy is in flight,

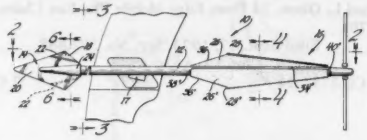
b. at least three equiangularly spaced arms extending radially outward from said hub and each terminating in a tip at a free end,

c. at least one of said tips being turned upward at a first predetermined angle to the plane of its arm, and at least another of said tips being turned downward at a second predetermined angle to the plane of its arm.

3,881,730
ARROWHEAD

Richard F. Carella, 35572 Stratchcona Dr., Mt. Clemens, Mich. 48043

Division of Ser. No. 442,419, Feb. 14, 1974. This application Sept. 4, 1974, Ser. No. 502,937
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 B **6 Claims**

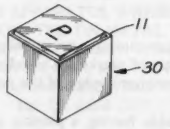


1. An arrowhead comprising first and second identical halves, each of said halves having a pair of planar sections which abut a pair of planar sections of the other half, one of said planar sections of each of said pairs having an outward extremity thereof extending laterally outwardly from the adjacent planar section of the other half to define a fin, said fins of said halves being diametrically oppositely disposed and inclined inwardly toward each other in a direction from front to rear.

3,881,731
CHESS PIECES

Laurence E. Droney, 429 Hess Ave., Erie, Pa. 16507

Filed Dec. 14, 1973, Ser. No. 424,858
Int. Cl. A63f *3/02*
U.S. Cl. 273—137 R **1 Claim**



1. A chess set comprising

a plurality of identical chess pieces,

each said chess piece comprising a cube shaped member having six equal sides,

each said side of a said cube having a different symbol thereon, each symbol representing one of the chess pieces of a chess set,

a plurality of boxes,

each said box having five equal sides and an open top,

the inside dimensions of each said box being substantially equal to the outside dimensions of said cubes,

each said cube fitting snugly into a said box with one side of each said cube exposed.

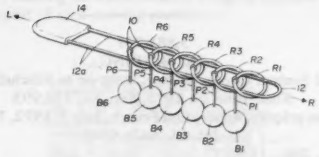
3,881,732
RING, POST AND LOOP PUZZLE WITH INDIVIDUAL POST ANCHORS

Louis M. Winslow, Rt. 2, Belle Plaine, Iowa 52208

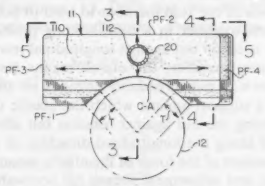
Filed May 17, 1974, Ser. No. 471,000
Int. Cl. A63f *9/08*
U.S. Cl. 273—158 **5 Claims**

1. In a puzzle of the type described including a number of post-like members having respective first and second corresponding ends and an equal number of ring-like members, the ring-like members being articulately attached adjacent the first corresponding ends of the post-like members, and an elongated, closed loop-like member in interlocking engagement with respective pairs of the post-like and ring-like members so that the loop-like member can normally be disengaged from the post-like and ring-like members only by a series of

prescribed manipulations of all of the members, the improvement comprising: individual members attached to the second corresponding ends of the post-like members, the individual members and the post-like members being otherwise unconnected to each other, each of the individual members having an overall exterior dimension sufficient to prevent its passage through the interiors of the ring-like members and the interior of the loop-like member.

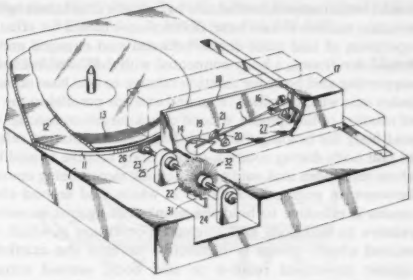


3,881,733
MULTI-FACED GOLF BALL PUTTERS
Elmer L. Csernits, 31192 Sunset Ct., Birmingham, Mich. 48009
Filed Mar. 27, 1974, Ser. No. 455,228
Int. Cl. A63b *53/04, 53/14*
U.S. Cl. 273—168 **3 Claims**



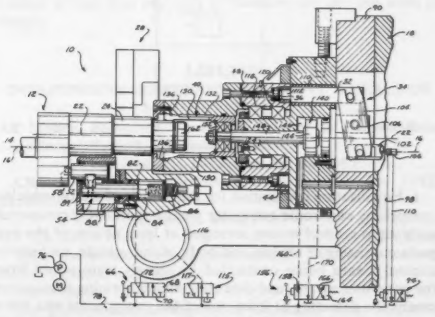
1. A multi-faced golf ball putter comprising
a. a generally rectangular putter head having a flat top and bottom, vertically disposed rectangular elongated putter side faces, and substantially square putter end faces,
b. the longitudinally central portion of one putter side face is vertically arcuately cut-away to a lateral depth slightly greater than approximately one-half the radius of a conventional golf ball, said cut-away terminating into a pair of relatively narrow laterally spaced vertical outwardly and angularly directed tangent portions permitting the stroking of said golf ball centrally of said putter side face,
c. a vertically disposed round tapered shaft fixed at its lower end vertically into the top of the said putter head longitudinally central thereof and laterally midway between the center of the vertical arcuate cut-away portion of said one putter side face and the opposite putter side face,
d. a substantially square tapered hand grip element telescoped at its lower end portion over and fixed to the upper end portion of said round tapered shaft with each side of said tapered hand grip being oriented in general parallelism with respect to one side or one end of said putter head, and
e. a non-slip covering fixed firmly on said square tapered hand grip.

3,881,734
ROTARY STYLUS CLEANER
Marvin Allan Leedom, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Jan. 30, 1974, Ser. No. 437,963
Int. Cl. G11b *3/58*
U.S. Cl. 274—1 R **5 Claims**



1. In a disc playback system including a board, a turntable mounted for rotation relative to said board and having a turntable surface adapted to receive a disc having a spiral groove with information recorded therein; a stylus subject to placement in said groove for recovering said information while in a play position; and a light stylus-arm carrying said stylus, said stylus-arm being mounted with respect to said board in a manner permitting movement of said stylus between rest and play positions substantially radially of said disc; a rotary stylus cleaner comprising:
a rotatable brush, having an axis of rotation substantially perpendicular to the longitudinal axis of the light stylus-arm mounted on said board, said brush including bristles with axes ordinarily disposed in planes substantially parallel to the stylus-arm longitudinal axis and substantially perpendicular to the axis of rotation of said brush, and said brush being located in the path of movement of said stylus between the rest position and the play position radially of said disc; and
drive means secured to said board and coupled to said brush for causing rotation of said brush for the purpose of cleaning said stylus.

3,881,735
WORKHOLDER
Glover C. Joyce, Worcester, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Mar. 13, 1974, Ser. No. 450,666
Int. Cl. B23b *5/34*
U.S. Cl. 279—5 **16 Claims**



1. A workholder for supporting a crankshaft with one of a plurality of crankpins in axial alignment with the axis of rota-

tion of a spindle, said workholder comprising a base adapted to be connected with the spindle for rotation therewith, main chuck means connected with said base for holding the crankshaft with one of the crankpins in axial alignment with the axis of rotation of the spindle, said main chuck means being operable between an engaged condition in which said main chuck means is effective to hold the crankshaft against rotation relative to said base and a released condition in which said main chuck means is ineffective to hold the crankshaft against rotation relative to said base, first actuator means for effecting operation of said main chuck between said engaged and released conditions, a body connected with said base, means for supporting said body for rotation relative to said base about an index axis which is offset from and extends parallel to the axis of rotation of the spindle, second chuck means connected with said body for holding the crankshaft against rotation relative to said body during rotation of said body relative to said base about said index axis, said second chuck means being operable between an engaged condition in which said second chuck means is effective to hold the crankshaft against movement relative to said body and a released condition in which said second chuck means is ineffective to hold the crankshaft against movement relative to said body, second actuator means for effecting operation of said second chuck means between the engaged and released conditions, said body and second chuck means being rotatable relative to said base and first chuck means about said index axis with said second chuck means in the engaged condition and said first chuck means in the released condition to move said body from a first position in which one of the crankpins is in axial alignment with the axis of rotation of the spindle toward a second position in which another of the crankpins is in axial alignment with the axis of rotation of the spindle, and index means for accurately locating said body in the second position with the other crankpin in axial alignment with the axis of rotation of the spindle.

3,881,736

EQUALIZATION INSTALLATION FOR THE CHASSIS OF MOTOR VEHICLES

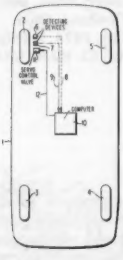
Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft

Continuation-in-part of Ser. No. 98,240, Dec. 15, 1970, abandoned. This application June 5, 1973, Ser. No. 367,191

Claims priority, application Germany, Feb. 28, 1970, 2009489; May 2, 1970, 2021474

Int. Cl. B60g *21/08*

U.S. Cl. 280—6.1 **10 Claims**



1. Equalization installation for the chassis of motor vehicles, comprising electronic computer means operatively connected with servo-control means arranged at least at one of the two parts consisting of chassis and body of the vehicle, said servo-control means being controlled by signals transmitted from the computer means, and detecting means forming transmitter means for detecting at least one of the movements and force changes of at least one of the two parts consisting of chassis and body, said detecting means being operatively connected with said computer means for feeding the signals detected by said detecting means to said computer means, said computer means being responsive to the signals of said detecting means for processing the signals and for transmitting output signals to the servo-control means to effect an equalization of the chassis, said detecting means including acceleration responsive means for detecting and feeding signals indicative of the positioning of one of the parts consisting of chassis and body to said computer means for processing thereby.

3,881,737

SKI BINDING

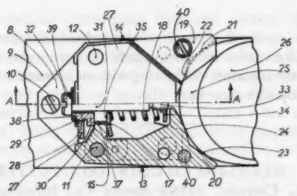
Bernard Sentou, Cluses, France, assignor to Mitchell S.A.

Filed June 29, 1973, Ser. No. 374,993

Claims priority, application France, July 3, 1972, 72.24209

Int. Cl. A63c *9/00*

U.S. Cl. 280—11.35 T **5 Claims**



1. Safety ski binding comprising a frame, a pair of jaw members pivotally mounted on the frame for movement of boot-engaging parts of the members together and apart, a stop member constituting an abutment for extremities of the jaw members which limits movement of the boot-engaging parts together, elastic means for urging said extremities of the jaw members towards the stop member to tend to hold said boot-engaging parts together in a boot-holding position, a screw mounted for rotation but against longitudinal movement relative to the stop member, the elastic means being disposed along the screw, a nut threadably engaged on the screw and constituting a support against which the elastic means bears, means for fixing the nut against rotation but allowing movement thereof along the longitudinal direction of the screw to enable adjustment of the force of the elastic means by rotation of the screw, and adjustment means for screwably mounting the stop member on the frame to enable adjustment of the position of the stop member in the longitudinal direction of the screw and thereby adjustment of the separation of said boot-engaging parts in said boot-holding position independently of any adjustment of the force of the elastic means by the screw and nut.

3,881,738

REGULATING DEVICE FOR AN ELASTIC SYSTEM WITH ADJUSTMENT INDICATOR ESPECIALLY FOR SAFETY FIXING DEVICE FOR SKIS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Filed Sept. 21, 1973, Ser. No. 399,749

Claims priority, application France, Sept. 27, 1972, 72.34232

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **4 Claims**

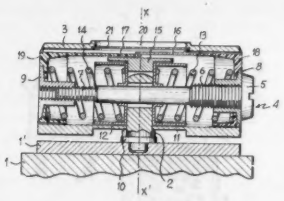
1. A safety binding for a ski boot comprising:

a binding body mounted on a ski and provided with a jaw for retention of said boot on said ski,

an elastic locking system housed inside said binding body and adapted to maintain said boot on the ski in a determined position, said locking system comprising two springs disposed in series and two parts movable in translation inside said body and fixed against rotation, each said part having a central threaded bore, each of said

spring bearing, at one extremity, on a portion of said binding and, at the other extremity, on one of said two moving parts;

a screw extending axially into said springs in series, said screw having two threaded portions of opposite pitch engaged respectively in the corresponding central threaded bore of said moving parts, the actuation of said screw causing the simultaneous bringing together or moving apart of said moving parts;



two blades fixed respectively to one of said moving parts, said blades extending substantially parallel to said regulating screw in the direction of each other, their free extremities overlapping in a centnral zone of said binding body;

and a window formed in said binding body at the level of the overlapping zone of said blades.

3,881,739

CHILD'S COLLAPSIBLE STROLLER

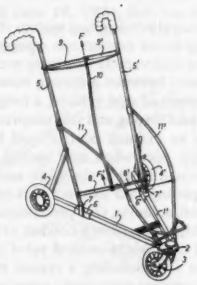
Pierre Laune, Attiches, France, assignor to Unilando, Attiches, France

Filed Aug. 13, 1973, Ser. No. 387,656

Claims priority, application France, Jan. 12, 1973, 73.01008

Int. Cl. B62b *7/08*

U.S. Cl. 280—42 **7 Claims**



1. A child's stroller of the type comprising a frame formed of foldable elements, a support seat made of supple material resting on said frame and a plurality of bearing wheels mounted on said frame, wherein said frame is constituted by a median support plate,

rolling means mounted on said support plate

two side elements articulated on said support plate, said side elements thus forming a pair of compasses

two lateral bearing wheels, each mounted on one end of each of said side elements opposite said support plate

a foldable connecting means adapted, when put in active position, to cause said side elements to form a triangular chassis resting on said rolling means and two wheels

two lateral uprights, each resting on one side element and being articulated on the respective side element

two side arms articulated at one end of the median support plate, the opposite end of each side arm being articulated substantially at the center of a respective upright.

3,881,740

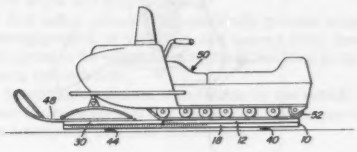
WHEELED SNOWMOBILE STORAGE PALLET

Bruce A. Johnson, 1165 128th Avenue N.E., and Marvin D. Webster, 12957 Pierce St. N.E., both of Blaine, Minn. 55433

Filed May 2, 1973, Ser. No. 356,285

Int. Cl. B62b *5/00*

U.S. Cl. 280—79.1 **4 Claims**



1. In combination with a snowmobile of the type including forward opposite side longitudinal skis and a centrally disposed longitudinally extending endless drive track whose forward end is spaced appreciably rearward of the forward ends of said skis, a storage pallet comprising an elongated low profile horizontal body having a first end portion of a width less than the distance between the forward opposite side skis of said snowmobile, said body including opposite side outwardly projecting lateral extensions spaced from the free end of said first end portion and disposed adjacent the other end of said body, said extensions extending longitudinally of the other end portion of said body, the remote outer portions of said extensions being spaced apart a distance greater than the distance between the outer side marginal edges of said skis, the distance between said free end of said first end portion of said body and the adjacent portions of said extensions being greater than the distance between the forwardmost point of contact of said track with a flat support surface upon which said snowmobile is resting and the forwardmost point of contact of said skis with said support surface, the opposite end portions of said body including sets of dependingly supported opposite side low silhouette ground engaging support wheels spaced from the corresponding terminal ends of said body a distance whereby the body, when inclined and supported from a flat surface by only one set of said wheels and the corresponding terminal end of said body, will be inclined only slightly relative to said surface at an angle represented by an incline of less than one unit of measure rise per ten units of length.

3,881,741

INDEPENDENT SUSPENSION OF FRONT WHEELS OF MOTOR VEHICLES

Alf Muller, Bittenfeld, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Aug. 15, 1973, Ser. No. 388,657

Claims priority, application Germany, Nov. 14, 1972, 2255679

Int. Cl. B62d *7/20*

U.S. Cl. 280—96.2 A **32 Claims**

1. An independent wheel suspension for the front wheels of motor vehicles, comprising:

wheel carrier means;

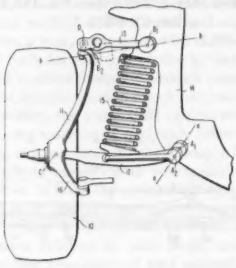
two guide means arranged one above the other and with pivot axes intersecting in the center position of the wheel, on the one hand, as viewed in side view, at a relatively large distance to the rear of the front wheel below the

wheel center and, on the other hand, as viewed in plan view, at a relatively large angle;

joint means connecting the guide means with the wheel carrier means;

a steering axis being determined by the straight line passing through the joint means;

the pivot axis of the upper guide means, as viewed in plan view, extending rearwardly outwardly;



the pivot axis of the lower guide means, as viewed in plan view, extending at least nearly parallel to the vehicle longitudinal axis and the pivot axis of the upper guide means extending rearwardly outwardly approximately diagonally;

the steering axis, as viewed in side view, intersecting the road surface in front of the point of contact of the wheel, thereby defining a positive caster;

wherein said caster has a minimum within the main spring deflection range.

3,881,742

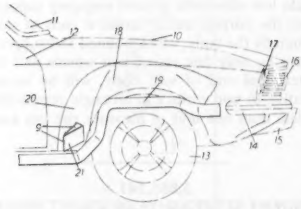
MOTOR VEHICLE ENERGY-ABSORBING FORWARD STRUCTURE

Bertold Felzer, Russelsheim, Main, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1973, Ser. No. 403,849

Int. Cl. B62d *21/00*

U.S. Cl. 280—106 R **2 Claims**



1. A motor vehicle comprising, in combination, a forward vehicle structure collapsible upon impact of the vehicle with an obstacle and including a frame, a pair of front wheels mounted on the forward vehicle structure, and a deflector element on the vehicle respective to each front wheel and located rearwardly thereof, each element being independent of the frame and including a deflector surface extending angularly and outwardly of the vehicle structure and lying in a horizontal plane including the wheel center, collapse of the forward vehicle structure moving the wheels into engagement with the deflector surfaces of the respective deflector elements to force the wheels angularly and outwardly of the vehicle.

3,881,743

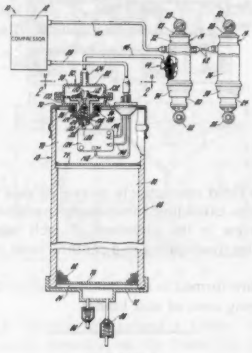
AUTOMOTIVE LEVELING SYSTEM

James E. Whelan, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1974, Ser. No. 466,157

Int. Cl. B60g *17/04*

U.S. Cl. 280—124 F **3 Claims**



1. In an automatic vehicle leveling system of the semi-closed loop type including an air compressor operable continuously during operation of said vehicle to supply pressurized air to a leveling unit disposed between a sprung mass portion and an unsprung mass portion of said vehicle, a height-control valve disposed between said sprung and said unsprung mass portions and connected to an exhaust port of said leveling unit for closing said exhaust port when said sprung mass portion is below a predetermined height relative to said unsprung mass portion and for opening said exhaust port when said sprung mass portion at least achieves said predetermined height, and an air drier assembly disposed in a conduit extending between an exhaust port of said height-control valve and an inlet port of said compressor and including a system inlet and exhaust assembly, an improvement comprising pressure-sensing means disposed in said conduit between said height-control valve exhaust port and said air drier and including a movable control element assuming a first position when said conduit is pressurized to a predetermined superatmospheric level corresponding to the open position of said leveling unit exhaust port and a second position when the pressure in said conduit is below said predetermined level corresponding to the closed position of said leveling unit exhaust port, electrical circuit means including a source of electrical potential and a pair of electrically energized indicator means for signalling respectively when said sprung mass portion is below and at least achieves said predetermined height, and electrical switch means operatively connected to said control element and disposed in said circuit means between said source and said indicator means for energizing respective ones of said indicator means when said control element is in a corresponding one of said first and said second positions.

3,881,744

AUTOMOBILE PASSENGER RESTRAINT

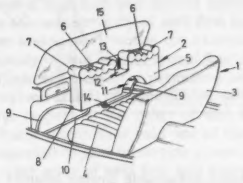
Earl Silas Tupper, Panama, Panama, assignor to TUPI (Panama) S.A., Panama City 5, Panama

Filed Dec. 26, 1972, Ser. No. 318,327

Claims priority, application United Kingdom, Dec. 22, 1971, 59542/71

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 B **4 Claims**



1. In an automobile, a passenger restraint means comprising: a substantially continuous frame extending transversely within said automobile, a pivot axis for said frame also extending transversely within said automobile, whereby said frame can be pivoted between a raised position and a lowered position overlying a seat of said automobile, two upstanding arms, each providing a pivot at an upper end located one at each end of said pivot axis, a torsion bar clamped to said automobile intermediate its ends and holding at said ends the lower ends of said upstanding arms, and a substantially vertical resilient concave restraint region extending transversely across, and carried upon, said frame to restrain a seated person at the waist, whereby said seat cannot be occupied until the frame is pivoted upwards therefrom, and driver vision is obscured until said frame is again pivoted downward and lowered over the occupant's legs to restrain him at the waist.

3,881,745

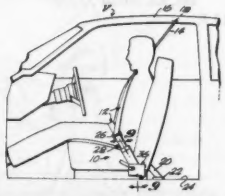
VEHICLE OCCUPANT RESTRAINT DEVICE

Evelio F. Chavez, Jr., 211 S.W. 55th Ave., Miami, Fla. 33134

Filed June 19, 1974, Ser. No. 480,691

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **17 Claims**



1. A vehicle occupant restraint device for use in combination with a vehicle body defining an occupant compartment providing a seat therein, accessible through a side opening and a side door having a forward, generally vertical edge, pivoted to the vehicle body to mount the door for movement between open and closed positions relative to the side opening, said restraint device comprising;

A. a first belt having a first end, fixed relative to an inboard portion of the vehicle roof and a second end, fixed relative to an inboard portion of the vehicle floor;

B. a second belt having a first end, fixed relative to a slide buckle, slidable engaged along an intermediate portion of said first belt, and a second end fixed to a belt retractor reel of the type which locks the belt against retraction upon rapid deceleration of the vehicle, said first belt being positioned to normally pass over the inboard shoulder of the occupant and said second belt being positioned to engage over the lap of the occupant;

C. a main housing providing an interior chamber rotatably mounting said retractor reel;

D. rail means, fixed longitudinally along the bottom portion of the door for engagement by follower means, carried by said housing, to cause said housing to move longitudinally to a position adjacent the lower front, pivoted edge of the door when said door is open to disengage said first and second belts, respectively, from the shoulder and lap areas of the occupant to provide unobstructed exit from the vehicle, and to cause said housing to move rearwardly to a position to re-engage said first and second belts, respectively, with the shoulder and lap areas of an occupant when said door is closed;

E. a first safety means to automatically prevent accidental disengagement of said first and second belts from the occupant in the event of an accident resulting in the door being opened; and

F. a second safety means, controllable by the vehicle occupant to disengage said first and second belts to provide for an emergency exit from the vehicle.

3,881,746

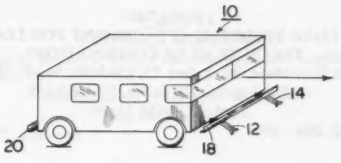
VEHICLE LEVELER SYSTEM

C. Lewis Newcomb, Jr., 520 11th Ave., Haddon Heights, N.J. 08035

Filed Dec. 19, 1972, Ser. No. 316,472

Int. Cl. B60s *9/02*

U.S. Cl. 280—150.5 **5 Claims**



1. A leveler system for an over-the-road vehicle having a spring suspended frame comprising, in combination with said vehicle: a plurality of jack devices each having an adjustable length, said jack devices each including a plurality of telescoping members,

a lower ground-engaging portion on each said device,

said ground engaging portion on the lower of said jack members having an edge for frictionally engaging the ground during rotation of the jack device to the vertical condition,

and means for pivotally securing the upper portion of each said jack device to the spring suspended frame of the vehicle adjacent a different corner thereof,

said pivot securing means including means attachable to the bumper of the vehicle for suspending the upper of said telescoping members to rotate around a horizontal and vertical axis,

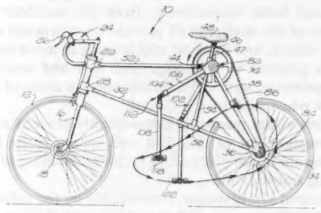
so that said vehicle can be partially elevated for leveling various amounts at each corner by driving the jack devices in the direction of movement of said vehicle for rotation of the lengths thereof to a vertical condition with a partial extension of the spring frame of said vehicle, and said vehicle can be restored to normal over-the-road condition by driving said jack devices for rotation of the lengths thereof to be inclined to the vertical.

3,881,747

VARIABLE MOTION BICYCLE PEDAL DRIVE SYSTEM

Allan V. Abbott, 708 Calle Arboles, Redondo Beach, Calif. 90277

Filed June 19, 1974, Ser. No. 480,656
Int. Cl. B62m *1/04*
U.S. Cl. 280—255 **4 Claims**



1. In a bicycle having a frame, a variable motion bicycle pedal drive mechanism comprising:

a drive wheel on said frame having a first drive mechanism secured to said wheel for transmitting motion thereto;

a second drive mechanism on said frame;

a coupling member for coupling said first drive mechanism to said second drive mechanism;

said second drive mechanism secured to said frame; and

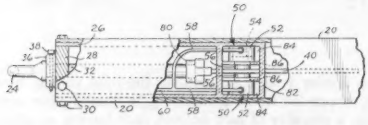
means mounting at least one foot pedal to be freely positionable in a plane intersecting the axis of the second drive mechanism and movable to transmit one-way rotational power to said second drive mechanism.

3,881,748

ANTI LOAD STRIPPING ATTACHMENT FOR LOGGING TRUCK-TRAILER COMBINATIONS

Jack D. Donaldson, Rt. 4, Box 73, Chehalis, Wash. 98532

Filed July 26, 1973, Ser. No. 383,439
Int. Cl. B62d *53/00*
U.S. Cl. 280—404 **4 Claims**



3. In an anti-load stripping logging truck-trailer unit the combination of:

a. a truck frame,

b. a hollow trailer reach,

c. a compensator shaft mounted for longitudinal sliding movement in the trailer reach,

d. releasable compensator shaft lock means engaging the compensator shaft for releasably locking it against longitudinal sliding movement,

e. latch means releasably interconnecting the truck frame and the compensator shaft,

f. a case mounted entirely within the forward end of the trailer reach and receiving the compensator shaft,

g. securing means securing the case to the trailer reach,

h. elongated friction plate means attached to the compensator shaft as a rearward longitudinal extension thereof,

i. friction clamp means mounted in the case and positioned for releasable frictional clamping engagement with the friction plate means, and

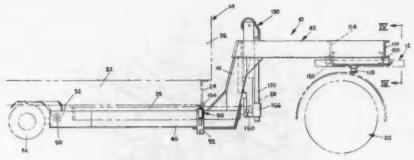
j. clamp control means connected to the clamp means and operable from a remote station.

3,881,749

TOWING COUPLER ASSEMBLY FOR FACTORY MADE HOMES

Howard P. Berends, Fruitport, Mich., assignor to Holland Hitch Company, Holland, Mich.

Filed Feb. 1, 1974, Ser. No. 438,870
Int. Cl. B62d *53/06*
U.S. Cl. 280—415 B **21 Claims**



1. An attachable-detachable towing coupler assembly for mounting to and towing of, from the front end, a parallelepiped structure having supporting under-girders and a wheeled undercarriage, comprising:

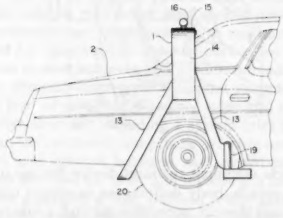
a bifurcated frame having a front portion and rear portions; said rear portions being shaped to extend beneath the structure front end, being spaced from each other and including attachment zones connectable to under-girders of the structure spaced rearwardly from the front end of the structure; said frame front portion being upwardly offset relative to said frame rear portions and having cooperative coupling means thereon connectable with complementary coupling means on a towing vehicle to enable a stable elevated coupling thereto; and compression-load, structure-engagement means on said frame between said front and rear portions, to selectively engage the structure front end, thereby affording a multiple point securement for the structure while towed on its wheeled undercarriage.

3,881,750

TRAILER HITCH

Merdith John Shatto, 3615 Brandon St. S.E., Calgary, Alberta, Canada (T2G 4A7)

Filed Nov. 8, 1973, Ser. No. 413,893
Claims priority, application Canada, Aug. 14, 1973, 178795
Int. Cl. B62d *53/00*
U.S. Cl. 280—423 R **3 Claims**



1. A trailer hitch for operable connection with a towing vehicle having a body, a frame and wheels connected to the frame, said hitch comprising:

a first lateral frame member for extending generally upright on one side of the vehicle body and including first and second means connected to one end of said first lateral member for extending beneath the vehicle body for attaching said first lateral frame member to the frame of the vehicle at longitudinally spaced points on the vehilce frame;

a second lateral frame member for extending generally upright on the other side of the vehicle body and includ-

ing first and second means connected to one end of said second lateral frame member for extending beneath the vehicle body for attaching said second lateral frame member to the frame of the vehicle at longitudinally spaced points on the vehicle frame;

transverse means interconnecting the other ends of said first and second lateral frame members and operably extending over a portion of the vehicle body;

means carried by said transverse means for attachment to a trailer or other vehicle to be towed;

at least one of said first and second means for extending beneath the vehicle body of said first lateral frame and said first and second means for extending beneath the vehicle body of said second lateral frame being provided with adjustment means for permitting lateral adjustment of at least one of said first and second lateral frame members with respect to the other of said first and second lateral frame members at said one of the ends thereof;

means connected to said transverse means and at least one of the other ends of said first and second lateral frame members for permitting lateral adjustment of at least one of said first and second lateral frame members with respect to the other of said first and second lateral frame members at said other of the ends thereof; and

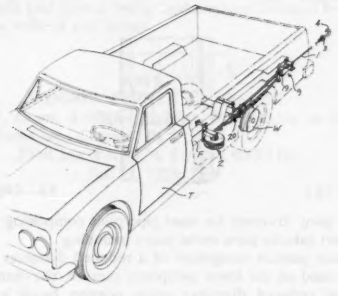
means for pivotally connecting at least one of said first and second means connected to each of said first and second lateral frame members to a corresponding part of each of said first and second lateral frame members.

3,881,751

AUTOMATICALLY STOWABLE TOWLINE FOR VEHICLE

Raymond Lee Colby, Star Rt.; Box 4, Quincy, Wash. 98848

Filed Mar. 4, 1974, Ser. No. 447,998
Int. Cl. B60d *1/18*
U.S. Cl. 280—480 **3 Claims**



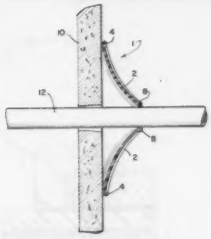
1. An automotive vehicle comprising a wheel-supported vehicle chassis, a towline, storage means for said towline mounted on said chassis, abutment means fixedly mounted on said vehicle chassis independently of and at a location spaced from said storage means for transmitting pulling stress from said towline to said chassis separate from and independently of said storage means, and stop means carried by said towline at a location between said storage means and said abutment means and engageable with said abutment means by paying out said towline from said storage means to limit the extent to which said towline can be paid out from the vehicle, said storage means including automatic tension-producing towline-retrieving means always exerting tension on said towline irrespective of the position of said stop means for maintaining said towline taut between said abutment means and said storage means and for moving said stop means away from said abutment means and toward said storage means when the tension in said towline at the side of said abutment means and said stop means remote from said storage means slackens below the tension exerted by said towline-retrieving means on the portion of said towline between said abutment means and said storage means.

3,881,752

FLANGE

George S. Fujishima, 1713 Kaumulii St., Honolulu, Hawaii

Filed Sept. 24, 1973, Ser. No. 399,684
Int. Cl. E04b *5/48*
U.S. Cl. 285—46 **7 Claims**



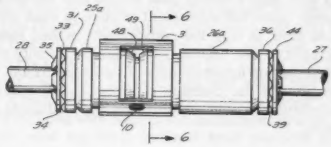
1. A wall hole and pipe sealing flange comprising a relatively thin flexible laterally resilient plastic body having a generally round circumferential edge and having a central generally round opening for receiving and tightly gripping a pipe whereby when the central opening is placed over a pipe and slid toward a wall slightly spaced from a wall, only the outer circumferential edge portion automatically presses tightly against the wall, and the body portion between the outer circumferential edge and the central opening assumes a uniform smooth curve.

3,881,753

FASTENER MECHANISM

Michael E. Bochory, 5000 Centinela Ave., Los Angeles, Calif. 90066

Filed June 4, 1973, Ser. No. 366,299
Int. Cl. F16j *15/00*
U.S. Cl. 285—92 **10 Claims**



1. A fastener assemby for joining pipe ends, comprising a female member adapted to accommodate one pipe end, a male member adapted to accommodate another pipe end and insertable into said female member; at least two axially spaced abutment means respectively provided on said female and male members; and springy retaining means adapted to be snapped onto said members in contact with said abutment means, so as to prevent axial separation of said male and female members.

3,881,754

RESILIENT INTERNAL SUPPORT FOR PLASTIC PIPE

Joe William Christie, 1118 E. Main St., Frisco, Tex.

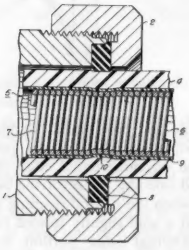
Continuation of Ser. No. 140,689, May 6, 1971, abandoned. This application Sept. 26, 1973, Ser. No. 400,721
Int. Cl. F16l *13/04*
U.S. Cl. 285—114 **2 Claims**

1. In combination, a pressure coupling, a plastic pipe one end of which is clampingly confined in said pressure coupling,

and an internal support within the confined end of the pipe, the support including

a helical resilient member having contiguous convolutions and an external diameter slightly less than the internal diameter of said pipe,

a sheath of semi-elastic thin material encasing the helical member and having its interior snugly engaging the exterior of the convolutions of said member so as to reduce the resiliency of the member only to the extent sufficient to prevent undue deformation thereof and of said pipe adjacent the coupling as well as excessive separation of said convolutions which might cause damaging of the sheath,



said sheath being film-like and having a radial thickness much less than the wall thickness of said member,

the sheath being free from attachment to said member and both said sheath and member being free from attachment to said pipe whereby said sheath and member may undergo restricted movement relative to each other and to said pipe, as may the convolutions of said member with respect to one another, and thereby amplify the area of deformation longitudinally of said support and pipe so as to prevent the creation of stress and flexures of small amplitude in said support and pipe adjacent said coupling.

3,881,755

DRILLSTRING STRUCTURE

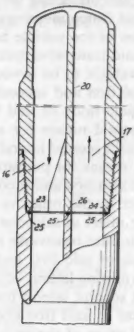
Siro Brunato, Via G. Galli 23, Melegnano, Italy (20071)

Filed June 26, 1972, Ser. No. 266,085

Int. Cl. F16l *39/00*

U.S. Cl. 285—137 A **1 Claim**

1. A two-way flow tube for a drillstring comprising a longitudinal partition wall within the interior of the tube, extending over the length of the tube and separating the tube into two longitudinal tubular compartments, the tube having a female inner screwthread at one end thereof and a mating male screw thread at the other end thereof, said partition wall having abutment surfaces at both extremities thereof for sealing engagement with partition walls of corresponding two-way flow tubes, said partition wall extending according to a diametral plane and having at, at least one end thereof a seat for a sealing gasket, wherein the tube ends have circular abutment surfaces, at least one of said surfaces having circular seats for sealing gasket means, and wherein the partition wall has enlargements at, at least one end thereof thereby to increase the abutment surfaces thereof, said enlargements tapering from



the periphery towards the center of the tube at least at the abutment surfaces thereof.

3,881,756

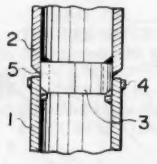
JOINTS FOR WELDING STEEL PIPE PILES

Ken Takatori, Kawasaki; Tetsuzo Hirose, Yokohama, and Tsuyoshi Nakamata, Hiratsuka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1973, Ser. No. 360,913

Int. Cl. F16l *13/02*

U.S. Cl. 285—22 **10 Claims**



1. A joint structure for steel pipe piles comprising:

a short tubular joint metal piece including:

a guide portion comprised of a reduced diameter portion formed on the lower periphery thereof, the diameter of said reduced diameter guide portion being gradually decreased radially; and

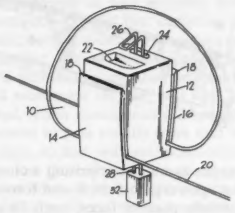
a straight-cylindrical portion formed on an upper periphery adjacent to said reduced diameter guide portion, the outer diameter of said straight-cylindrical portion being substantially equal to the inner diameter of a pile pipe to be joined;

an upper pile pipe, said joint metal piece being secured to the inner periphery of said upper pile pipe such that said straight-cylindrical portion and said reduced diameter portion of said joint metal piece project from a joint end of said upper pile pipe, said straight-cylindrical portion being adjacent said joint end of said upper pile pipe and said reduced diameter portion being remote from said joint end;

a lower pile pipe adapted to receive said upper pile pipe at a joint end thereof so as to be joined with said upper pile pipe by welding, said outer diameter of said straight-cylindrical portion being substantially equal to the inner diameter of said joint end of said lower pile pipe, said projecting portion of said joint metal piece being inserted

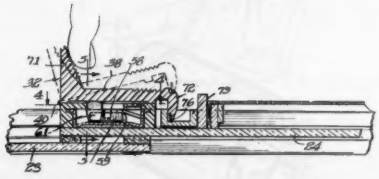
into said joint end of said lower pile pipe with at least a portion of said straight-cylindrical portion inserted in said joint end of said lower pile pipe so as to join said upper and lower pile pipes together.

3,881,757
KNOT TYING IMPLEMENT
Rudolph Guinther, Clifton, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed May 13, 1974, Ser. No. 469,285
Int. Cl. D03j *3/00*
U.S. Cl. 289—17 **5 Claims**



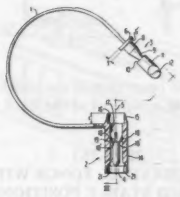
1. Knot tying implement comprising a body having a longitudinal bore therethrough; a cavity formed axially in the upper part of said body for receiving the center portion of a knot; gripper means attached to the opposite sides of said body and forming strand receiving slots for holding a strand of leader against said body and for forming a loop from said strand around said body; a hook member axially movable in said bore and having a hook portion extending above said upper part of said body for holding said center portion of said knot in said cavity while said knot is being tightened and finished by pulling on the ends of said strand.

3,881,758
WINDOW OPENER AND LATCH
George E. Gross, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Jan. 14, 1974, Ser. No. 433,110
Int. Cl. E05c *3/04*
U.S. Cl. 292—87 **12 Claims**



1. A latch for a multi-panel window or the like having a movable panel comprising; a stationary base element adapted for attachment to the movable panel, a latch member including a stationary mounting platform element attachably secured to said stationary base, a swing arm secured to said mounting platform for overlapping the mounting platform, hooked stop means mounted on the swing arm for engaging a stationary element of said stationary mounting platform to limit swinging motion of the swing arm relative to the stationary elements, and means interconnecting the swing arm and said stationary element to urge the spring arm into a locking position for engaging a fixed catch member.

3,881,759
PLASTIC SEAL
Charles Fuehrer, Scarsdale, N.Y., assignor to Stoffel Seals Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 89,542, Nov. 16, 1970, Pat. No. 3,712,655. This application Jan. 2, 1973, Ser. No. 320,175
Int. Cl. E05c *10/18;* **B65d** *33/34*
U.S. Cl. 292—321 **53 Claims**

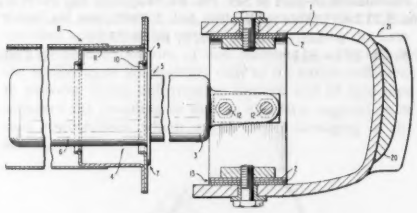


1. A seal comprising: housing means, a bore extending completely through said housing means with first and second bore ends opening to the outside of said housing means, locking socket means arranged in said bore in said housing means, a tie member having a free end and an end operatively connected to said housing means, and a locking head means at the free end of said tie member, said locking head means being insertable into the socket means by way of said first bore end to lock the seal, the socket means including at least one inwardly projecting locking element and the head means including a head portion with a locking shoulder formed between the head portion and an adjoining section with smaller cross-section, said head portion being dimensioned to elastically deflect the at least one locking element during insertion thereof so that the locking shoulder snaps in behind locking surface portions of the at least one locking element when the head portion is inserted into said socket means, the extreme free end of said head portion being positioned inside said bore at a spacing from said second bore end with said head means in a seal locking position, the extreme free end of said head portion which faces said second bore end when said head means is in a seal locking position including portions which are angularly inclined with respect to a centerline through said head portion, said angularly inclined head portions being arranged to provide a non-symmetrical spacing of points of the surface of said extreme free end of said head portion from said second bore end with respect to said centerline.

3,881,760
BUMPER FOR MOTOR VEHICLES
Hubert Hutai, Grafenau-Datzingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany
Filed Feb. 15, 1974, Ser. No. 443,098
Claims priority, application Germany, Feb. 15, 1973, 2307330
Int. Cl. B60r *19/06*
U.S. Cl. 293—99 **16 Claims**

1. A bumper for motor vehicles which in case of impact is retractable under energy-absorption by means of shock absorber means extending generally in the vehicle longitudinal direction and fixedly connected with a relatively fixed vehicle part, characterized in that the mounting of the bumper means takes place at least at one shock absorber means having shafts and guide tube means and includes an approximately bipole

shaped, substantially upright flat spring means yielding in the vehicle cross direction, and fastening means for the shock



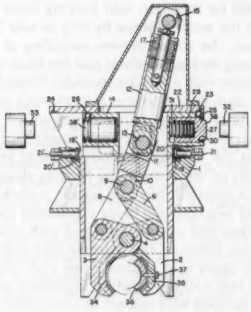
absorber means in the open area of the shock absorber guide tube means to provide a support at the fixed vehicle part.

3,881,761

AUTOMATIC MECHANICAL TONGS WITH OPEN AND CLOSED STABLE POSITIONS

Andre Meyer, Chatenay-Malabry, and Roger Gerard, Chevilly-Larue, both of France, assignors to Groupement Atomique Alsacienne Atlantique, Le Plessis, Robinson, France

Continuation-in-part of Ser. No. 193,266, Oct. 28, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,184
Claims priority, application France, Oct. 29, 1970, 70.39013
Int. Cl. B25b
U.S. Cl. 294—88 **2 Claims**



1. An assembly for locking mechanical tongs at open and closed stable position, said assembly comprising:

a framework;

a pair of clamping jaws mounted for pivoting between open and closed positions above a fixed axis within said framework;

a pair of connecting rods operatively coupled to said jaws and to an intermediate rod, and forming with said intermediate rod, a first knuckle joint slidable with respect to said framework;

a spring jack rotatable about a second fixed axis within said framework;

a sliding rod connected operatively on one side to said spring jack and on the other side to said intermediate rod forming with said intermediate rod, a second knuckle joint;

a slide operatively coupled to said second knuckle joint and transversally movable within said framework between stops on either side of a straight line defined by said first fixed axis and said second fixed axis; and

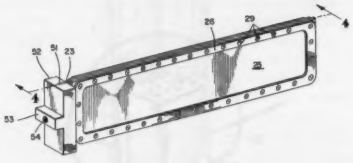
ball detent means carried by said slide for engaging said framework at positions defined by said stops to lock said slide with said second knuckle joint maintaining said jaws respectively in open and closed stable positions.

3,881,762

GRIPPER

Anthony T. Zappia, Indianapolis, Ind., assignor to Bail Brothers Service Corporation, Muncie, Ind.

Division of Ser. No. 321,003, Jan. 4, 1973, Pat. No. 3,826,382. This application Jan. 10, 1974, Ser. No. 432,408
Int. Cl. B66c *1/46*
U.S. Cl. 294—93 **6 Claims**



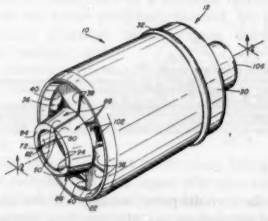
1. A bottle gripper element comprising a closed-perimeter frame defining an open region therein and formed to provide opposite, substantially parallel faces, each face defining an imperforate region extending perimetrally about said open region, a closure member spanning the open region of each such frame face and sealingly bearing upon the perimetral region of such face, at least one of said closure members being a rubberoid, elastic diaphragm, said closure members cooperating with the open region of said frame to define a chamber with said diaphragm being inflatable to expand outwardly from the plane of its respective face when fluid under pressure is injected into said chamber, said chamber having a port opening through a point in said frame perimeter, and a perimetral ring for securing said diaphragm in sealing engagement with its respective frame face, said perimetral ring having a rigid, non-yielding outer surface for engaging and guiding bottles for movement along said gripper element before inflation of said diaphragm.

3,881,763

CHUCK

Norman E. Benson, Naugatuck, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Filed June 3, 1974, Ser. No. 475,523
Int. Cl. B26f *3/00*
U.S. Cl. 294—116 **9 Claims**



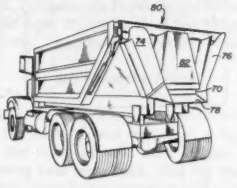
1. A chuck-like device comprising, in combination: a body; an outwardly biased actuating member mounted for reciprocation relative to said body between outward and inward positions, and having outwardly disposed article-engaging means thereon; at least one gripping member mounted on said body for pivotable movement about an axis generally perpendicular to the axis of reciprocation of said actuating member, said gripping member having a gripping element thereon disposed outwardly of said axis of pivoting for movement between an open position away from said article-engaging

means and a closed position adjacent thereto, and also having a follower element thereon spaced inwardly of said axis of pivoting, said gripping member being biased toward said open position of said gripping element; an outwardly biased positioning member mounted for reciprocation between outward and inward positions and having an outwardly tapered first camming surface thereon, said first camming surface being disposed to engage said follower element of said gripping member and to urge said gripping element into said closed position thereof, when said positioning member is in said outward position thereof; a setting member mounted outwardly of said positioning member for inward and outward reciprocation, said setting member having an outwardly tapered second camming surface thereon disposed to engage said follower element of said gripping member and being generally contiguous to said first camming surface when said positioning and setting members are adjacently disposed, said actuating member having means for engaging and moving inwardly said positioning member and said setting member upon inward movement thereof, and said camming surfaces being adapted, when contiguously disposed, to permit said follower element to pass readily from said second surface to said first surface; so that, with said positioning member in said outward position thereof and said gripping element in said closed position thereof, inward movement of said actuating member to a first position from said outward position thereof causes engagement and inward movement of said positioning member and said setting member, in turn permitting said gripping member to pivot to said open position of said gripping element, and so that further inward movement of said actuating member to a second position causes further inward movement of said positioning member and said setting member, and thereby causes said follower element to engage and bear upon said second camming surface, whereupon outward movement of said actuating member will permit said positioning member to return to said outward position thereof, with said follower element passing from said second to said first camming surface, and with said gripping element returning to said closed position thereof.

3,881,764
DUMP BED

John H. Holland, Norman, Okla., assignor to The J. H. Holland Company, Norman, Okla.

Filed Apr. 12, 1973, Ser. No. 350,638
Int. Cl. B62d *33/00*
U.S. Cl. 296—28 D **13 Claims**



1. In a dump bed of the type including a floor, opposed side walls, and a front wall which cooperate to define the front portion of the dump bed, the improvement comprising:

a pair of downwardly, inwardly, and forwardly tapering rear corner panels extending between upwardly tapered rear ends of the side walls and inwardly tapered side portions of the rear end of the floor to define the inner portion of a discharge chute located at the rear portion of the dump bed;

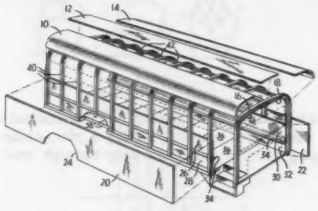
said panels extending to spaced apart inwardly tapered rear edges positioned substantially inwardly from the side walls and aligned with the central portion of the rear end of the floor for cooperation therewith to define a discharge opening of the discharge chute; and

a tailgate substantially identical in shape to the discharge opening and supported at the upper rear ends of the side walls for selective pivotal movement to open and close the discharge chute.

3,881,765
BUS BODY

Anthony M. Cerra, and Robert B. Kurre, both of Richmond, Ind., assignors to Indian Head, Inc., New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,694
Int. Cl. B62d *31/02*
U.S. Cl. 296—28 A **11 Claims**



1. A bus body comprising at least two elongated one-piece exterior roof panels extending substantially the entire length of the bus body and defining an exterior body roof, at least two elongated one-piece interior roof panels extending substantially the entire length of the bus body and defining an interior body roof, at least two elongated one-piece exterior side panels extending substantially the entire length of the bus body, one on either side thereof, and defining exterior body walls, at least two elongated one-piece interior side panels extending substantially the entire length of the bus body, one on either side thereof, and defining interior body walls, at least one floor panel defining an elongated body floor, at least three generally U-shaped one-piece rib members spaced at intervals along the length of the body and coupled adjacent the ends of said rib members to the body floor in an inverted position, the rib members being located between the interior and exterior side panels and between the interior and exterior roof panels and being joined to said panels, a gusset secured to each upper corner of each rib where the roof portion of the rib meets the respective side wall portion of the rib, each gusset having a right angle flange portion along an inwardly disposed edge thereof and each interior roof panel being shaped to match the shape of said flange portion of the respective gusset and being joined thereto, and upper side wall stringers installed between adjacent ribs, each stringer being generally U-shaped in cross section to define an inwardly open space and having a flange portion joined to a corresponding interior roof panel adjacent the outward margin thereof, the rib members and elongated panels affording a minimal number of body joints and presenting a minimal number of member and panel edges, thereby increasing the safety of passengers in the bus body in the event of a collision or upset.

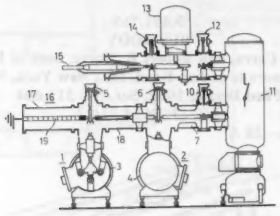
3,881,766
VOLTAGE OVERLOAD ARRESTER FOR A HIGH-VOLTAGE SWITCHING SYSTEM

Rudolf Pratsch, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,351
Claims priority, application Germany, Sept. 28, 1972, 2248117
Int. Cl. H02h *7/22*
U.S. Cl. 317—58 **4 Claims**

1. In a high-voltage switching system of the type including a switching housing containing a gaseous insulating medium, and an overload arrester housing, communicative with the

switching housing and containing a gaseous insulating medium having a dielectric strength the same as said medium contained in said switching system housing, a voltage overload arrester comprising only discharge current resistance means,



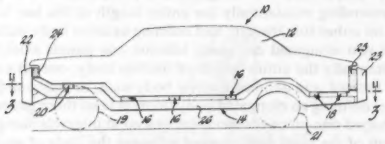
disposed in said arrester housing, and constructed of an electrically conductive material having a zinc oxide base, for discharging current surges flowing through said switching system.

3,881,767

VEHICLE IMPACT ENERGY ABSORPTION AND SUSPENSION SYSTEM

Gerard T. Klees, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,391
Int. Cl. B60r *19/00;* **B62d** *23/00;* **F16f** *16/08*
U.S. Cl. 296—35 R **6 Claims**



1. An impact energy absorption system for vehicles comprising a vehicle body, frame means for said vehicle body, said frame means comprising steel side rail means extending beneath said vehicle body, said frame means having front and rear end portions, laterally extending bumper means rigidly and directly connected to said front end portion of said frame means and in front of said vehicle body, first body mount means operatively connecting a front end of said body to said front end of said frame means to permit said body to move longitudinally relative to said frame after impact of said bumper means, second body mount means operatively connecting the rear end of said body to the rear end portion of said frame means, said second body mount means having resilient vibration damping means to dissipate vibratory energy in said frame means and said body, said second body mount means further having mechanical connector means operatively connecting said body and said frame means for positively limiting the longitudinal movement of said rear end of said body relative to said frame means after impact of said bumper means to compressively load said frame means from one end thereof to thereby effect the resilient deflection of said side rail means which absorbs and stores impact energy.

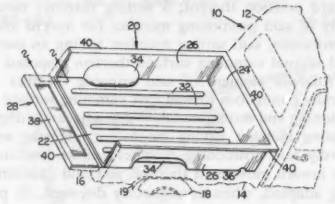
3,881,768

PICKUP TRUCK BED LINER AND PROTECTOR

Edwin Lee Nix, 733 Tahlena Ave., Madison, Tenn. 37115

Filed Aug. 10, 1973, Ser. No. 387,459
Int. Cl. B62d *33/02*
U.S. Cl. 296—39 R **4 Claims**

1. For use as a liner (**20**) to protect the bed of a conventional pickup truck (**10**), the improvement comprising a readily removable and replaceable one piece molded self-contained somewhat rigid liner (**20**) of inherently cushioning material integrally contoured complementary to the truck bed, tailgate (**16**) and the front and side walls of the pickup truck body (**14**), an integral outwardly extending flange portion (**40**) at the top of said liner front (**24**) and side wall portions (**26**) to extend over and protect the top edges of the truck front and side walls and a rearwardly extending tailgate



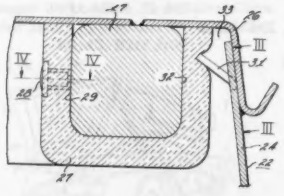
panel portion (**28**) integrally hinged (**30**) to the liner bed bottom portion (**22**) complementary to the pickup truck tailgate (**16**), hinging means (**30**) integrally connecting said tailgate panel portion (**28**) to the liner bed bottom portion (22) comprising a thin web integrally extending between the bed bottom portion and said tailgate panel portion, said hinged tailgate panel portion (**28**) having an outwardly upstanding flange portion (**40**) to overlie the top edge of the truck tailgate (**16**).

3,881,769

MEANS FOR SECURING INSULATION TO A VEHICLE ENCLOSURE

William R. Metzke, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Sept. 6, 1973, Ser. No. 394,916
Int. Cl. B62d *33/00*
U.S. Cl. 296—39 A **7 Claims**



1. In a vehicle enclosure of the type having a frame to which panels are secured, the combination comprising:

an elongated frame member comprising a first surface,

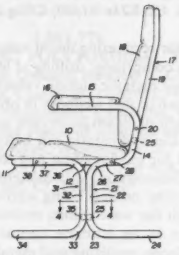
a panel defining a side of said enclosure and having a portion in juxtaposed relation to but spaced from said first surface of said frame member, said portion of said panel including a plurality of spaced apart lugs projecting in the direction of and at an angle to said first surface of said frame member, and

a pliable insulation member having an edge portion disposed between said first surface of said frame member and said lugs, the insulation member being compressed to a reduced thickness in the area of contact with said lugs whereby said insulation member is releasably held in place.

3,881,770
FOLDING CHAIR

Antonio Luis Cardenas, North Miami Beach, Fla., assignor to Hoover Industries, Inc., Miami, Fla.

Filed July 29, 1974, Ser. No. 492,785
Int. Cl. A47c 4/20
U.S. Cl. 297—51 12 Claims



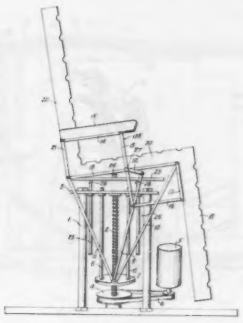
1. A folding chair comprising:
a seat unit presenting a horizontal seat and opposite arms extending up from the back of the seat and then forward substantially horizontally on opposite sides of the seat;
a back unit having its lower end received between the upwardly extending arms and pivoted to the latter for adjustment between an upright position in which it extends up from the back of the seat and a folded-down position in which it extends forward across the top of the seat between the arms;
a rear leg unit pivotally connected to the opposite sides of the seat unit toward the back end of the latter on the outside for adjustment between a floor-engaging support position extending down from the seat unit and a folded-up position extending up around the outside of said arms and forward across the folded-down back unit;
and a front leg unit pivotally connected to the opposite sides of the seat unit toward the front end of the latter on the outside for adjustment between a floor-engaging support position extending down from the seat unit in front of said rear leg unit and a folded-up position extending up around the outside of the seat unit at the front and back across the folded-down back unit.

3,881,771
CONVERTIBLE CHAIR

Daniel Amstutz, Domaine de Peyvideau, 33 Garignan, France

Filed Apr. 27, 1973, Ser. No. 355,082
Claims priority, application France, Apr. 27, 1972, 72.15780
Int. Cl. A47c 1/02
U.S. Cl. 297—71 3 Claims

1. Convertible chair comprising a seat, a back pivotally connected to the rear of said seat, and a leg rest pivotally connected to the front of said seat, double parallelogram linkage supporting said seat, back, and leg rest, said linkage comprising a first main bar supporting said seat and common to two parallelograms of said linkage, a second main bar pivotally connected near the center of said first main bar, and also common to both parallelograms of said linkage, a first shorter bar pivotally connected to one end of said first main bar and supporting said back, a second shorter bar pivotally connected to one end of said second main bar and one end of said first shorter bar to form a first parallelogram, a third shorter bar pivotally connected to the other end of said first main bar and supporting said leg rest, and a fourth shorter bar pivotally connected at one end to the other end of said second main bar and at the other end to said third shorter bar, a stationary platform, a movable platform mounted to slide vertically relative to said stationary platform, said seat being pivotally attached to said movable platform, motor driven screw means, and a crank connected to be driven by said screw means and to turn one of said main bars relative to the other between a first position in which said linkage supports said back and leg rest in a generally upright attitude and a second position in which said linkage supports said leg rest

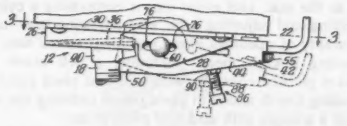


and back in a substantially horizontal attitude when said screw means is driven in a first direction, said crank being also connected to lift said linkage and seat vertically when said screw means continues to turn in said first direction after said crank has reached said second position.

3,881,772
CHAIR CONTROL MECHANISM

Harry L. Mohrman, Weatogue, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Oct. 3, 1973, Ser. No. 403,013
Int. Cl. A47c 3/00
U.S. Cl. 297—300 23 Claims

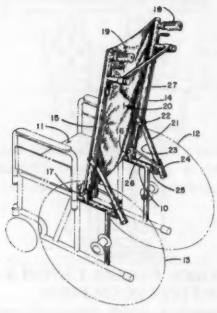


1. A chair control mechanism comprising: a first frame member extending forwardly and rearwardly and having a pair of parallel elongated vertical side wall portions, laterally outwardly extending upper flange portions integral with said side wall portions for attachment to the underside of a chair seat, and a lower transverse web portion interconnecting only the forward sections of said side wall portions and forming a U-shaped frame member, said web portion defining a laterally extending abutment; a second frame member; a transverse shaft extending through said second frame member and said side wall portions of said first frame member rearwardly of said web portion of the latter whereby to tiltably position said first and second frame members, said second frame member has at least one pair of vertically spaced, forwardly projecting are segments engageable with opposed sides of said web portion abutment of said first frame member for limiting relative tilting movement between said first and second frame members in both directions, the axis of said transverse shaft lying substantially in the same horizontal plane as said web portion, and spring means connected with said transverse shaft and extending between said first and second frame members in one direction.

3,881,773
RECLINING BACK WHEELCHAIR

Keith S. Rodaway, Culver City, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.

Filed June 3, 1974, Ser. No. 475,524
Int. Cl. A47c *1/026*
U.S. Cl. 297—377 6 Claims



1. In combination with a frame structure supporting a seat, a reclining back assembly including:

a. back rest means pivoted at a first pivot point to said frame structure for movement from a generally upright position to a reclining position;

b. an adjusting tube pivoted at one end at a second pivot point to the back rest means intermediate its lower and upper ends;

c. a guide means in slidable engagement with the other end of the adjusting tube and pivoted at a third pivot point to the frame structure at a spaced point to the rear of said first pivot point;

d. actuating linkage means coupled to said frame structure and manually movable to lock said back rest means relative to the seat, said guide means comprising a cylinder receiving said adjusting tube, said adjusting tube having a plurality of openings alone one longitudinal side, said actuating linkage means including a bell crank type bracket pivoted coaxially with said first pivot point and including fourth and fifth pivot points defining the vertices of a triangle with said first pivot point;

e. a pawl member pivoted at said third pivot point and including a pawl juxtaposed the adjusting tube in a position to be received in and removed from a selected one of said openings upon rocking movement about said third pivot point and further including a sixth pivot point defining with said third pivot point and pawl the vertices of a second triangle; and

f. a tie rod pivoted to said fifth and sixth pivot points,

whereby rocking movement of said bell crank type bracket member moves said tie rod to thereby rock said pawl member in a direction to remove the pawl from an opening in said adjusting tube and permit the back rest means to be moved to a desired reclining position and locked in said position by rocking said bell crank type bracket member in an opposite direction to insert the pawl in a juxtaposed opening, the ratio of the distances between said first and fifth pivot points and the distance between said third and sixth pivot points being inversely proportional to the ratio of the angle through which said back rest means moves and and the angle through which said adjusting tube moves, so that the relationship between the pawl member and the guide cylinder remains substantially constant throughout reclining movements of said back rest means.

3,881,774
OXIDATION OF SULFIDE DEPOSITS CONTAINING COPPER VALUES

Hendrik Karel Van Poolen, Littleton, Colo., and Ray Vincent Huff, Acton, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

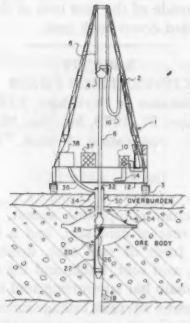
Filed Apr. 18, 1974, Ser. No. 461,902
Int. Cl. E21c *41/00*; C01g *3/10*
U.S. Cl. 299—4 10 Claims

1. In a process for recovering metal values by in-situ mining of same, the steps comprising: drilling at least one wellbore in an ore body having metallic sulfide values; injecting mixture of steam and oxygen in said wellbore in proportions of at least 25:1 ratio by weight of steam to oxygen as a gas whereby the gas is at least at the hydrostatic but below the rock parting pressure required for gas injection and the temperature, depending on the composition, is consistent with the injection pressure, said in-situ mining being carried out at a depth preferably beneath the water table; maintaining a mixture of steam and oxygen in an intimate contact in said ore body adjacent said wellbore; oxidizing said metal sulfides in said ore body whereby sulfur, sulfur dioxide and/or trioxide are formed and subsequently converted to sulfuric acid with said steam, said sulfur dioxide and/or trioxide thereby forming an acid lixiviant solution in said wellbore; maintaining said lixiviant solution in intimate contact with said metal values in said ore formation, and recovering said metal values together with said lixiviant and condensed steam.

3,881,775
MINING METHOD AND APPARATUS THEREFOR

Frank Alfred McPherson, Moore, Okla., and Homer Charles Reed, Newport Beach, Calif., assignors to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 400,378, Sept. 24, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,467
Int. Cl. E21b *3/12*; E21c *41/00*
U.S. Cl. 299—18 16 Claims



10. A method of mining a subterranean body of coal from a surface station comprising the steps of:

1. providing a bore hole extending from the surface into the body of coal;

2. introducing a rotatable member, having a fluid passageway therethrough and an elongated powered cutting member near its lower end, into the bore hole until the elongated cutting member is in the body of coal;

3. pivoting the elongated cutting member outwardly to contact the coal, applying power to the elongated cutting member and rotating the rotatable member and elongated cutting member whereby coal is cut from the body;

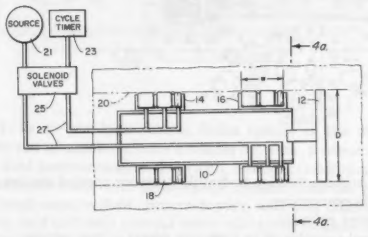
4. circulating a fluid having a specific gravity of from about 1.1 to about 2.5 and an API funnel viscosity of from about 35 to 80 seconds per quart into the area being mined and forming an aqueous suspension of the cut coal; and
5. recovering the aqueous suspension of coal at the surface station.

3,881,776

VERMICULATING POLYTOROIDAL THRUSTER

Richard H. Fashbaugh, Oxnard; Howard A. Gaberson, Camarillo; Philip L. Stone, Camarillo; Donald E. Williams, Camarillo, and John M. Stephenson, Camarillo, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,332
Int. Cl. E01g *3/04*
U.S. Cl. 299—31 **12 Claims**



1. A vermiculating polytoroidal thruster assembly comprising:
   a. a spool having a cylindrical center and a pair of disc-shaped end plates;
   b. a plurality of adjacently mounted, toroidal-shaped bladders held between the end plates on the cylindrical center of the spool;
   c. means for selectively inflating and deflating certain bladders simultaneously in a predetermined sequence; and
   d. means for confining the axial expansion of each bladder during inflation.

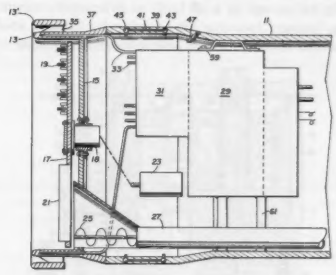
3,881,777

APPARATUS AND METHOD FOR LARGE TUNNEL EXCAVATION IN SOFT AND INCOMPETENT ROCK OR GROUND

John H. Altseimer, and Robert J. Hanold, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,402
Int. Cl. E21c *9/04*
U.S. Cl. 299—33 **3 Claims**

1. An earth tunneling machine comprising an elongated structural hull having a forward portion and a rearward portion, a closure plate affixed to the front end of the forward portion at right angles to the longitudinal axis of the hull, a peripheral segmented earth kerf melting penetrator of elongated plates affixed in adjacent relationship at the front end of the hull, a nuclear reactor supported in the hull, a plurality of heat pipes each thermally coupled at one end to the nuclear reactor core and at least one of such heat pipes being coupled at the other end to each of the earth kerf melting penetrator plates and adapted to maintain the kerf melting penetrator plates at a temperature above the melting temperature of earth materials, a rotary rock and earth cutting plate rotatably supported on the axis of the closure plate, motor means supported in the hull and coupled to the cutting plate for rotating the same, means for transporting the earth debris loosened by the cutter plate away from the cutter plate, said kerf melting penetrator having an outwardly flared skirt on the rearward portion thereof whereby melted earth is trowelled outward against and into the tunnel walls, a peripheral band portion at the front end of the hull constituting a tunnel liner forming



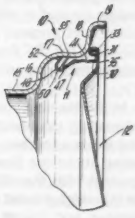
band, liquid coolant means for thermally cooling the tunnel liner forming band, whereby said tunnel liner forming band supports the molten earth against the tunnel walls while simultaneously solidifying said molten earth into a tunnel wall initial supporting liner.

3,881,778

WHEEL TRIM LOCKING RINGS

Herbert Buerger, Walton, N.Y., assignor to Del-Met Corporation, Walton, N.Y.

Filed Sept. 13, 1973, Ser. No. 396,708
Int. Cl. B60b *7/06*
U.S. Cl. 301—37 B **2 Claims**



1. A locking ring comprising an annular flange, spring fingers extending from one side of the annular flange, said fingers each having a pair of transversely extending ribs, said fingers having bent back lips at their outer ends, flange means extending radially outwardly from the other side of said annular flange, and a wheel trim attached to said flange means, said spring fingers each having axially inwardly convergent side edges and said ribs of each finger converging axially inwardly, and said ribs of each finger being parallel to the side edges of said finger, said converging ribs being radially inwardly depressed, each finger having a peripheral rib between said pair of converging ribs, said peripheral ribs extending radially outwardly.

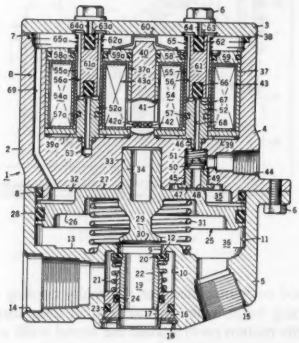
3,881,779
BRAKE ANTI-LOCK MECHANISM

John A. Machek, Creve Coeur, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 218,293, Jan. 17, 1972, Pat. No. 3,758,167. This application May 21, 1973, Ser. No. 362,018

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 F 4 Claims



1. A control valve for an anti-lock brake system comprising:
a housing;
relay means movable in the housing and operable generally in response to control fluid pressure subjected thereto to effect a metered application through the housing of fluid pressure supplied thereto;
means for controlling the control fluid pressure subjected to the relay means comprising an electric solenoid valve energized in response to a preselected condition to isolate the control fluid pressure acting on the relay means and vent the isolated control fluid pressure, the relay means being responsive to the reduction of the control fluid pressure upon the venting thereof to effect a proportional reduction of the applied fluid pressure;
a flow passage in the housing for the flow therethrough of the control fluid pressure upon the subjection thereof to the relay means;
exhaust passage means in the housing corresponding to the flow passage for exhausting the control fluid pressure prior to energizing the solenoid valve;
a valve seat in the housing about the flow passage;
valve means for engagement with the valve seat, the valve means being movable into engagement with the valve seat to close the flow passage and isolate the control fluid pressure acting on the relay means upon the energization of the solenoid valve;
other exhaust passage means in the housing for communication with the isolated control fluid pressure;
another valve seat in the housing about the other exhaust passage means, the solenoid valve including other valve means for engagement with the other valve seat, the other valve means movable toward a position disengaged from the other valve seat to vent the isolated control fluid pressure through the other exhaust passage means upon the energization of the solenoid valve to engage the first named valve means with the first named valve seat;
recess means in the housing constituting a portion of the flow passage, the exhaust passage, and the other exhaust passage; and
a chamber connected with the recess means.

3,881,780
BRAKE HYDRAULIC PRESSURE CONTROL SYSTEM FOR VEHICLES

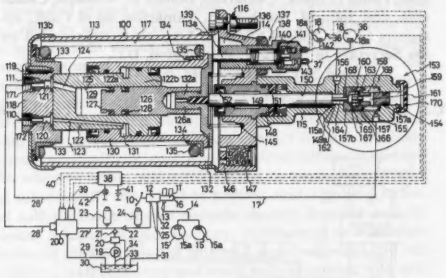
Mizuo Nyunoya, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha

Filed Apr. 30, 1973, Ser. No. 355,324

Claims priority, application Japan, May 13, 1972, 47-047463

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 F 6 Claims



1. A brake actuating hydraulic pressure control system for a vehicle comprising;
a master cylinder,
a wheel cylinder of at least one wheel of the vehicle,
a hydraulic circuit communicating said cylinders,
a pressure control valve device disposed within said circuit for controlling the relative hydraulic pressure supplied to said wheel cylinder after the master cylinder pressure exceeds a predetermined value,
said pressure control valve device including a housing having a bore, a stepped piston slidably mounted within said bore and having a first effective area portion exposed to the master cylinder pressure to urge said piston in one direction and said piston having a second portion of a greater effective area than that of said first portion, said second portion being exposed to the hydraulic pressure in said wheel cylinder to move said piston in opposition to the master cylinder pressure, a spring means for biasing said piston in said one direction, and a valve member for on-off controlling said hydraulic circuit in response to the movement of said piston,
means for sensing a substantial wheel skidding condition and delivering an instructive signal as a result of the sensing,
a change-over valve means movable in response to said instructive signal,
a skid control device for relieving the hydraulic pressure of the brake in said wheel cylinder through said change-over valve means, and
said skid control device including a plunger movable within said hydraulic circuit and operatively contacted with said valve member of said pressure control valve device and said plunger has a portion which normally holds said valve member of said pressure control valve device in the open position, whereby under skid condition said valve member is closed and said stepped piston is contacted with said housing in response to the movement of said plunger so as to interrupt the hydraulic communication between said master cylinder and said wheel cylinder, and the effective volume of said hydraulic circuit between said valve member and said wheel cylinder is varied in response to the movement of said plunger and a control piston operatively connected with said plunger for effecting the movement of said plunger through said change-over valve means to reduce the brake pressure.

3,881,781
ANTI-LOCK VEHICLE BRAKE SYSTEMS

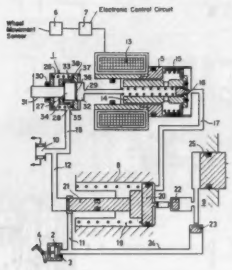
Derek Robert Skoyles, Salfords, Near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 366,189

Claims priority, application United Kingdom, June 19, 1972, 28585/72

Int. Cl. B60t *8/00, 17/18*

U.S. Cl. 303—21 AF **8 Claims**



1. In an anti-lock vehicle brake system of the character referred to which includes a master cylinder, a wheel cylinder in fluid communication therewith, a relief connection in fluid communication with said wheel cylinder and an anti-lock control valve in fluid communication with said relief connection, said anti-lock control valve selectively modulating pressure in said wheel cylinder the fail-safe improvement comprising, means for inhibiting fluid flow from said relief connection to said anti-lock control valve, said means for inhibiting including mechanical biassing means providing a force for biassing said means for inhibiting to an inhibiting position, said means for inhibiting being responsive to fluid pressures in said relief connection such that with said anti-lock control valve closed, fluid pressure in said relief connection due to a braking action and above a certain minimum value determined by the force of the biassing means causes displacement of said fluid inhibiting means to an unhibiting position at which it cannot impede flow of fluid through said anti-lock control valve when the latter is actuated while said fluid pressure exists, and with said anti-lock control valve actuated in the absence of said fluid pressure, a fluid pressure drop across said fluid inhibiting means arising from a subsequent braking action causes said fluid inhibiting means to remain in said inhibiting position in which it severely restricts flow of fluid through the actuated anti-lock control valve.

3,881,782
ANTI-LOCK VEHICLE BRAKE SYSTEMS

Derek Robert Skoyles, Salfords, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,910

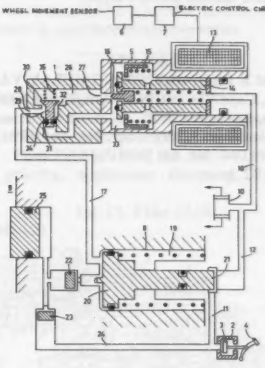
Claims priority, application United Kingdom, Sept. 18, 1972, 43228/72

Int. Cl. B60t *8/02, 13/16*

U.S. Cl. 303—21 F **4 Claims**

1. An anti-lock vehicle brake system of the type used 2the a vehicle wheel and an associated wheel brake including a fluid pressure sourse which in response to a braking action provides fluid under pressure by a fluid pressure connection to the brake, the fluid under pressure being effective to produce braking pressure at the brake to cause the letter to apply a braking force at the wheel, a solenoid anti-lock control valve having an inlet in fluid communication with the brake, wheel movement sensing means producing an output signal causing the anti-lock control valve to open when a predetermined relationship exists which signifies when wheel locking is imminent, and a relief connection in fluid communication with the brake and the outlet of the anti-lock control valve, opening of (the anti-lock control valve reducing fluid pressure in said brake by allowing displacement of fluid away from the brake into the relief connection, the improvement which comprises in said relief connection at the outlet side of said anti-lock control valve a fail-safe arrangement for comparing the fluid pressure at the outlet side of the anti-lock control valve with the fluid pressure at the brake, said fail safe arrangement comprising:

a. means responsive to fluid flow at the outlet of the anti-lock control valve due to the anti-lock control valve being at least partially unsealed at the onset of brake pressure



application when the anti-lock control valve is unactuated whereby there is pressure build-up at the outlet of said anti-lock control valve, the fail-safe arrangement sealing the outlet of the anti-lock control valve and

b. if there is no fluid pressure build-up at the outlet of said anti-lock control valve at the onset of brake pressure application, said fail-safe arrangement being responsive to the fluid pressure at the brake to unseal said relief connection and thereafter maintain it unsealed notwithstanding subsequent build-up of fluid pressure at said outlet side due to actuation of the anti-lock control valve responsive to the wheel sensor.

3,881,783
FIXED SLIP HYDRAULIC ANTI-LOCK BRAKING SYSTEM

Samuel Shiber, Mundelein, Ill., assignor to Benjamin Ron, New York, N.Y.; Royce H. Husted, Wheaton and Samuel Schiber, both of, Ill.

Filed Feb. 8, 1974, Ser. No. 440,860

Int. Cl. B60t *8/06, 13/16*

U.S. Cl. 303—21 F **7 Claims**

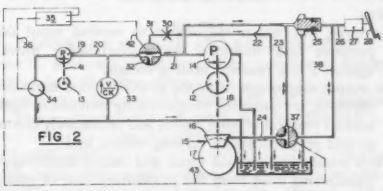


FIG 2

1. In an airplane landing gear of the type having a first, braked wheel, and a second, less than fully braked wheel, an anti-lock braking system comprising in combination;

a first positive displacement hydraulic pump driven by said first wheel,

a hydraulically actuated brake means for braking said first wheel,

a second positive displacement hydraulic pump driven by said second wheel, the output of said second pump being less than the output of said first pump when said wheels are rotating at equal peripheral speeds, and

conduit means connecting an output port of said first pump with the input port of said second pump and with said brake means,

wherein said first wheel's braking is regulated by said system so as to cause said first pump's output to substantially equal to said second pump's input.

3,881,784

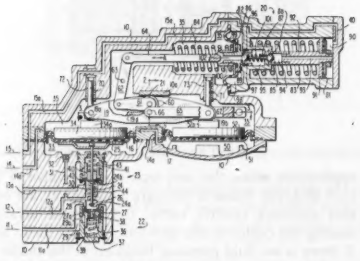
VARIABLE PROPORTIONING RELAY VALVE

Thomas Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,479

Int. Cl. B60f *8/18*

U.S. Cl. 303—22 A **6 Claims**



1. In a variable ratio relay valve of the type including a relay valve portion having inlet and outlet ports and a movable valve element actuable to permit fluid flow from said inlet port to said outlet port in response to a control means; and control means for actuating said valve element, said control means comprising means responsive to a first input control pressure for providing an actuating force, means for applying an actuating force to said valve element and means operably connecting said force providing means and said force applying means for adjustably varying the proportionality between the force provided by said force providing means and the force applied to said valve element by said force applying means in response to a servo mechanism, an improved servo mechanism comprising:

an input diaphragm responsive to second input control pressure and mounted for reciprocating movement against a first resilient biasing means;

an output diaphragm response to said second input control pressure, mounted for reciprocating movement against a second resilient biasing means and operatively connected to said proporitonality varying means; and

valve means linking said input and output diaphragms for transferring fluid from the pressurized side of said input diaphragm to the pressurized side of said output diaphragm in response to movement of said input diaphragm due to a rise in said second input control pressure and/or movement of said output diaphragm due to mechanical feed-back from said proportionality varying means.

3,881,785

LOAD RESPONSIVE AIR BRAKE SYSTEM FOR VEHICLES INCLUDING A SPRING-LOADED CYLINDER

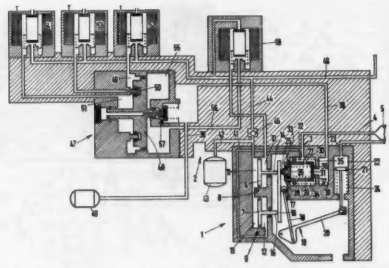
Hans Pollinger, Munich, and Karlheinz Splanemann, Grobenzell, both of Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed Apr. 3, 1974, Ser. No. 457,641

Claims priority, application Germany, Apr. 3, 1973, 2316587

Int. Cl. B60t *8/22*

U.S. Cl. 303—22 R **6 Claims**



1. In a load responsive air brake system for vehicles, particularly railway vehicles, comprising a main air line connected to a source of compressed air, a spring-loaded cylinder having a piston actuatable by a load responsive release pressure against the force of said spring, a load brake valve connected to said main air line so as to be operable thereby and having air passage means communicating with said cylinder, first and second control pistons in said load brake valve, a beam acted upon by said control pistons, a fulcrum upon which said beam is balanced, means for deplacing said fulcrum in response to the load on the vehicle, a control reservoir connected to said main air line and acting upon one side of said control pistons, means connecting the other side of said second piston to said spring-loaded cylinder, and a pressure reducing valve connected between said main air line and the other side of said first piston is subjected to a pressure proportional to the degree of braking.

3,881,786

INERTIA RESPONSIVE PROPORTIONING VALVE

William Stelzer, Milford and Edward J. Hayes, Ann Arbor, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

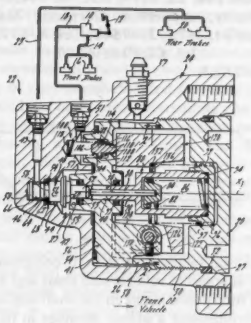
Continuation of Ser. No. 124,214, March 15, 1971, abandoned. This application July 23, 1973, Ser. No. 381,598

Int. Cl. B60t *11/34, 8/18*

U.S. Cl. 303—24 F **14 Claims**

7. In an automotive vehicle having front and rear brake systems operated by fluid pressure, the improvement comprising: brake pressure proportioning means for modulating the brake pressure to provide a relatively lower pressure in the rear brakes and a relatively higher pressure in the front brakes to compensate for weight transfer during braking, said proportioning means comprising a proportioning valve having an open condition and a closed condition, spring means for keeping said proportioning valve open with a preselected bias, fluid pressure operated means responsive to said fluid pressure to increase the bias of said spring means to increase the resistance to actuation of said closed condition of said proportioning valve, control valve means actuable to a closed position for interrupting communication of said fluid pressure to said fluid pressure operated means to prevent further increasing of said bias of said spring means, vehicle deceleration sensing means for actuating said control valve means to said closed position

in response to vehicle deceleration, and means responsive to the increase in bias of said spring means to resist actuation of



said control valve means to said closed position until a higher vehicle deceleration is attained.

3,881,787

BALL BUSHING

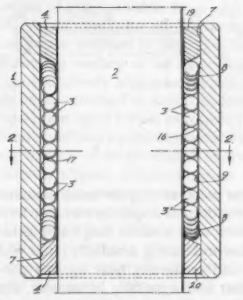
Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Feb. 12, 1973, Ser. No. 331,515

Claims priority, application Sweden, Feb. 14, 1972, 1715/72

Int. Cl. F16c *17/00*

U.S. Cl. 308—6 C **7 Claims**



1. The combination comprising a shaft member, and an elongated tubular sleeve member adapted for longitudinal movement relative to one another, said sleeve member circumscribing said shaft member, and spaced therefrom to define an annular space therebetween, a plurality of ball elements in the annular space between said shaft member and sleeve member and a cage for guiding said ball elements comprising first and second cage sections each including an annular portion having a plurality of axially directed fingers, the fingers of each cage section being interdigitated so as to form a continuous ball path for the ball elements about the periphery of the shaft member, the circumferential distance between confronting side walls of adjacent fingers being larger than the diameter of the balls when measured adjacent the sleeve member but smaller than the diameter of the balls when measured adjacent the shaft member, means defining on the inner surface of said sleeve member confronting the peripheral surface of said shaft member, a series of axially extending, circumferentially spaced grooves having a cross sectional radius of curvature conforming closely to the radius of curvature of the ball elements to obtain good osculation therebetween, the grooves of a first series being recessed deeper into said sleeve member than the grooves of a second series disposed intermediate said first series and the cage fingers being of a predetermined configuration with respect to the ball elements and the shaft member so that the ball elements are in bearing contact with the shaft member and sleeve member when in said second groove series and move in one direction during relative movement of said shaft member and sleeve member and are free to rotate without contacting both the sleeve member and shaft member when in said first groove series and move in said first groove series in a direction opposite movement in said second groove series.

3,881,788

ARRANGEMENT FOR LUBRICATING A BEARING

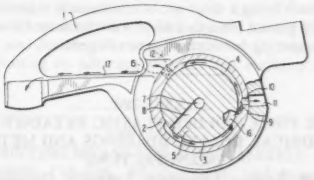
Fritz Kotauczek, Schanbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Feb. 6, 1974, Ser. No. 440,009

Claims priority, application Germany, Feb. 7, 1973, 2305834

Int. Cl. F16c *13/00*

U.S. Cl. 308—21 **19 Claims**



1. An installation for the lubrication of a bearing which includes a bearing sleeve means with a first oil supply groove means extending in the circumferential direction and provided at the inner surface of the bearing sleeve means, a pin provided with a radial oil supply bore terminating in said oil supply groove means, characterized in that the bearing sleeve means is provided with a second oil supply groove means extending substantially in the same direction as the first-mentioned oil supply groove means and at a distance therefrom, the pin which is relatively fixedly arranged and on which the bearing sleeve means is rotatably supported, being provided with a recess means which, in the starting position of the bearing sleeve means, overlaps only one of the oil supply groove means and which, upon slight rotary movement of the bearing sleeve means, so connects the two oil supply groove means with each other that the previously interrupted oil flow is lifted and the lubricating oil which is under pressure is conducted to lubricating oil places by way of the second oil supply groove means.

3,881,789

CONVEYOR ROLLER AND BEARING SEAL

Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

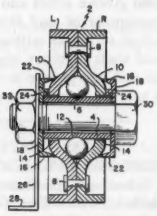
Division of Ser. No. 128,081, March 25, 1971, abandoned. This application June 8, 1973, Ser. No. 368,133

Int. Cl. F16c *33/78*

U.S. Cl. 308—187.1 **4 Claims**

1. In combination, a roller comprising a rim, a hub having a central bore therein, said hub extending through and projecting beyond the ends of the rim, a bearing assembly rotatably mounting the rim on the hub with a clearance space therebetween, and means sealing said space on opposite sides of the rim, said sealing means each comprising a disc of elasto-

meric material having an opening of a diameter less than the outer diameters of the ends of the hub, a flexible annular lip having a greater diameter than the hub extending laterally from the periphery of the disc, at least three fingers extending from the wall of the disc in the same direction as the lip and being of a shorter length than the lip but of a length to extend along the projecting end of the hub and bear against the rim



when the disc wall lies against the end of the hub, said fingers being equiangularly spaced concentrically about the axis of the bore on a radius slightly smaller than the outer periphery of the hub for gripping the hub when flexed outwardly, said fingers each being a short arc of elastomeric material with the concavity toward the axis and of a circumferential extent less than the spacing between adjacent fingers.

3,881,790

ONE PIECE MOLDED PLASTIC RETAINER FOR CYLINDRICAL ROLLER BEARINGS AND METHOD OF MANUFACTURE

Robert M. Ryanen, Commerce Township, Oakland County, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Aug. 6, 1973, Ser. No. 385,859
Int. Cl. F16c *33/49*
U.S. Cl. 308—217 **10 Claims**

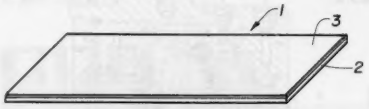
1. In a bearing assembly including a plurality of rollers retained in circumferentially-spaced relationship, the improvement comprising a one-piece molded plastic retainer defining a plurality of pockets within which the rollers are disposed, said retainer comprising a pair of spaced circular side rails interconnected at circumferentially-spaced intervals by axially extending cross bars, each side rail comprised of a plurality of alternating arcuately-shaped upper side rail sections and lower side rail sections, each side rail section extending circumferentially between two adjacent cross bars and integrally connected thereto, said upper and said lower side rail sections disposed in alternating sequence circumferentially around each side rail and said upper side rail sections of one side rail disposed axially opposite to a lower side rail section of the other said side rail and vice versa.

3,881,791

DRY JOURNAL BEARING

Georg Hentschel, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Feb. 22, 1974, Ser. No. 444,832
Claims priority, application Germany, Mar. 2, 1973, 2310592; Sept. 21, 1973, 2347548; Oct. 4, 1973, 2349952
Int. Cl. F16c *27/00*
U.S. Cl. 308—237 R **19 Claims**



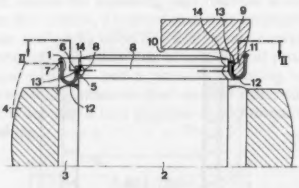
1. A dry journal bearing for a shaft comprising a housing having a bore adapted to receive said shaft and a bearing strip adapted to be interposed between the shaft and said bore, said bearing strip comprising a planar member in its normal state capable of being flexed to fit said bore and conform thereto on insertion of said shaft while maintaining its restorative force.

3,881,792

COMPACT AXIAL RETAINER SAFETY DEVICE FOR ROTATABLE MEMBERS

Michel Orain, Conflans-Sainte-Honorine, France, assignor to Societe Anonyme dite: Glaenzer Spicer, Poissy, France

Filed Apr. 8, 1974, Ser. No. 458,890
Claims priority, application France, Apr. 27, 1973, 73.15501
Int. Cl. F16c *19/24*
U.S. Cl. 308—237 R **6 Claims**



1. A resilient retainer ring for axially retaining at least one member for rotation on a spindle member having a groove in its outer surface, said retainer ring being generally U-shaped in cross-section and having a radially inner wall adapted to be clicked into and resiliently bear against the groove in the spindle member and a radially outer wall, the radially inner wall having corrugations, formed therealong, the mean circle of the corrugations being parallel to the general plane of the retainer ring, the radially innermost portions of the corrugations being tangent to a circle having a diameter less than that of the spindle member.

3,881,793

ANTI-TILT MECHANISM

Kenneth M. Anderson, Jamestown, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

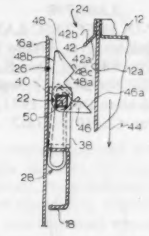
Filed Jan. 2, 1974, Ser. No. 429,750
Int. Cl. E05b *65/46;* **E05c** *15/04;* **A47b** *81/00*
U.S. Cl. 312—217 **15 Claims**

1. In a file cabinet of the type having a plurality of drawers supported by said cabinet in linear alignment with each other for horizontal movements between closed and open positions and an anti-tilt mechanism for preventing opening of other

drawers after a first drawer has been opened, the improvement wherein said anti-tilt mechanism comprises:

a plurality of latch means carried one on each of said drawers, each said latch means including abutment means and stop means, each said abutment means having leading and trailing surfaces relative to its path of travel as its associated drawer is moved towards open position;

an elongated rod mounted in and by said cabinet to extend perpendicular to an immediately adjacent said drawers for rotary movements about its own longitudinal axis; and a plurality of cam members fixed for simultaneous rotation with said rod and spaced therealong one in operative association with each of said latch means, each said cam member having an operator finger and an interlock-return finger, said cam members having a first drawer unlatched condition when all of said drawers are closed wherein their operator fingers are disposed in operative alignment with said path of travel of said abutment means of said latch means with which said cam members are operatively associated and their interlock-return fingers are removed from such alignment and a second drawer latched condition wherein their interlock-return fingers are disposed in operative alignment with said path of



travel of said abutment means of said latch means with which said cam members are operatively associated and their operator fingers are removed from such alignment, said cam members being movable from said first condition into said second condition upon movement of said first drawer into open position by driving surface engagement of said leading surface of its associated abutment means with its operatively aligned operator finger, said cam members being returned to said first condition from said second condition upon return movement of said first drawer to closed condition by driving surface engagement of said trailing surface of its associated abutment means with its operatively aligned interlock-return finger, said other drawers being prevented from being opened while said first drawer is in open position due to surface engagement of said leading surface of their associated abutment means with their operatively aligned interlock-return fingers and said interlock-return fingers of said cam members operatively associated with said latch means carried by said other drawers surface engaging with said stop means of said other drawers to prevent movement of said interlock-return fingers from operative alignment with said abutment means in a direction away from said first condition.

3,881,794

CABINET

Walter Henning, Miami Lakes, Fla., assignor to Regal Wood Products, Inc., Miami, Fla.

Filed Oct. 16, 1973, Ser. No. 406,796

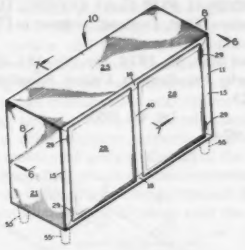
Int. Cl. A47b *47/04*

U.S. Cl. 312—259 **15 Claims**

1. A cabinet comprising, in combination, a single blank formed of a substrate and at least one laminated face by grooving the same to define a living hinge of laminate between ones of a first sidewall, a bottom adjoining the first said sidewall, a second sidewall adjoining said bottom, and a top joining said second sidewall for closing into rectangular enclosure, a pair of stiles extending from the vertical front edge of each of said first sidewall and second sidewall and joined thereto by a living hinge,

a top rail extending downwardly from said top and joined thereto by a living hinge,

a bottom rail extending upwardly from said bottom adjoined thereto by a living hinge,



each of said top rail, bottom rail, and stiles having complementary ends proportioned for abutting relationship with the adjacent rails and stiles whereby the front portion of the cabinet is framed,

each of said top rail, bottom rail, and stiles having a double groove and double plate to define a reversely folded back part abutting its adjacent sidewall and masking all raw edges.

3,881,795

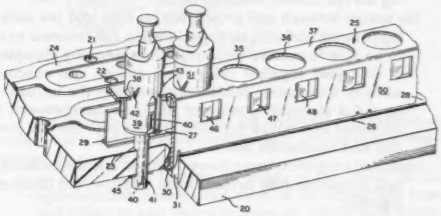
MOUNTING MEANS FOR DIODE MATRIX

Robert Franklin Cobaugh, Elizabethtown, and James Ray Coller, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 2, 1974, Ser. No. 466,101

Int. Cl. H05k *1/12*

U.S. Cl. 339—17 C **20 Claims**



1. Mounting means for mounting a plurality of diodes upon a substrate comprising the combination of:

a plurality of apertures formed in said substrate;

a plurality of female contact receptacles individually positioned in each of said apertures;

an elongated channel-shaped element having a generally U-shaped cross-sectional configuration formed by side walls and a transverse section and positioned over said apertures in an inverted manner, with at least portions of the open edges of said side walls of said channel resting upon the surface of said substrate and electrically insulated from said female contact receptacles at all points;

a plurality of second apertures formed in the transverse section of said channel, with each of said second apertures being substantially concentric with respect to one of said first apertures;

said female receptacles each being constructed to receive a first terminal of a diode inserted in the associated concentric aperture in said channel element; and

said associated concentric aperture being of a size to receive and make physical contact with the diode inserted therethrough to both mechanically support said diode and also to make electrical contact with the second terminal of said diode.

3,881,796

TERMINAL FOR FLAT CONDUCTOR

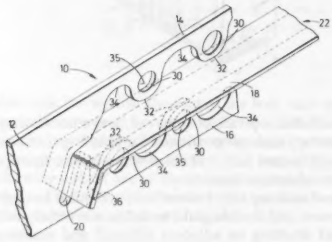
Laurie A. Saunders, Fleet, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,108

Claims priority, application United Kingdom, Mar. 23, 1973, 14077/73

Int. Cl. H01r

U.S. Cl. 339—97 C **10 Claims**



1. A terminal for a flat electrical conductor which may have insulation on the opposed surfaces thereof comprising:

a pair of jaws adapted to receive said flat electrical conductor therebetween;

means on said jaws for making an electrical connection with said flat electrical conductor;

said means comprising longitudinally spaced projections on each said jaw extending toward the other jaw, the projections on one jaw being alternately disposed with respect to the projections on the other jaw, said projections having curved convex outer surfaces;

the spaces between said projections on each said jaw defining concave surfaces, said spaces being dimensioned so as to be able to receive said projections whereby clamping of said jaws together brings said convex and concave surfaces into mating relationship whereby the insulation on a flat electrical conductor disposed therebetween is deformed to produce electrical contact between said jaws and said conductor; and

each said projection being formed with an aperture whereby said projection may deform when said jaws are clamped together.

3,881,797

ARRANGEMENT OF REPLACEABLE CORD FOR ELECTRICAL APPARATUS

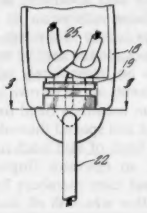
Edward M. Grandinetti, 2815 Los Flores Blvd., Lynwood, Calif. 90262

Filed Aug. 16, 1973, Ser. No. 388,823

Int. Cl. H01r *13/58*

U.S. Cl. 339—106 **1 Claim**

1. A replacement cord assembly for an electrical appliance comprising a pair of insulated wires for conducting electricity from a source to an appliance, the inner end of each of said wires carrying a male plug receivable in a female socket in the handle of said appliance; a plug adapted to be carried by said appliance, said plug having an external flange receivable in a groove formed in the interior of said handle, said flange and said groove cooperating to retain said plug in said handle, a pair of electrical wire inlet apertures, a pair of electrical wire outlet apertures, and a pair of channels, each of said channels communicating one of said inlets with one of said outlets, said inlets being disposed on opposite sides of said plug from one



another and said outlets being disposed on a third side of said plug; said electrical wires entering said plug through said inlet apertures, exiting said plug through said outlet apertures and being tied together in an underwriters knot between said outlet apertures and said male plugs.

3,881,798

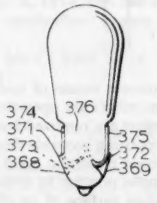
SNAP-IN ELECTRIC LAMP

John J. Horan, 420 Quigley Ave., Willow Grove, Pa. 19090

Continuation of Ser. No. 883,854, Dec. 8, 1969, abandoned, which is a division of Ser. No. 584,031, Sept. 7, 1966, Pat. No. 3,523,274. This application Dec. 2, 1971, Ser. No. 204,376

Int. Cl. H01r *13/62*

U.S. Cl. 339—144 R **21 Claims**



1. An electric lamp adapted for snap-latching into substantially simultaneous mechanical and electrical engagement with a holder having a conforming, elastically constricting portion that is provided with inwardly facing, lamp-compressing electrical contacts,

said lamp having a non-metallic body and comprising:

a sealed head formed at the upper end of said body,

said head containing a source of radiant energy and having a wall at least partly transmissive of the energy emitted by said source;

a laterally extending camming means formed at the lower end of said body,

said camming means having an insulative, laterally outermost surface,

said camming means being shaped to interfere with and dilate such portion during forcible downward insertion of said lamp into such holder;

a holder-engagement section positioned between said head and said camming means and joined to them; and

a plurality of conductive electrical terminals located on said section,

said terminals having generally laterally facing outer surfaces aligned to receive inward lamp-clamping force and electrical power from respective such contacts when said section is engaged to such holder,

said surfaces of said terminals being located inwardly of the lateral extent of said insulative laterally outermost surface of said camming means,

said terminals being connected to said source via respective electrical leads passing into said body,

said camming means having its upper teminus located and configured to pass through and cease interfering with such portion when said section has followed said camming thereinto, said camming means thereby releasing such portion to deliver said force and power through such contacts to said aligned terminals,

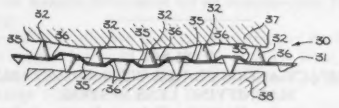
said upper terminus of said camming means being shaped to constitute a latch for subsequent retention of such elastically constricting portion thereabove.

3,881,799

RESILIENT MULTI-MICRO POINT METALLIC JUNCTION

George H. Elliott, 16501 Knollwood Dr., Granada Hills, Calif. 91344, and Leonard F. Roman, 11018 Moorpark, North Hollywood, Calif.

Filed Sept. 11, 1972, Ser. No. 287,593
Int. Cl. H01r *13/24, 13/02*
U.S. Cl. 339—252 R **10 Claims**



1. An electrical contact disposed between opposing irregular surfaces for making electrical connection therebetween, the combination comprising:

a pliable sheet of electrically conductive metallic material; a plurality of raised contact means outwardly projecting from opposite sides of said pliable sheet;

means formed in said pliable sheet associated with each of said raised contact means to permit separate and individual deflection of said raised contact means in response to engagement with the opposing irregular surfaces;

said last mentioned deflection means constructed to permit outward movement of said contact means substantially normal to said sheet and in parallel direction with respect to each other; and

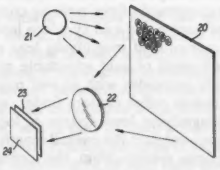
said deflection means comprise a pair of U-shaped slots formed about each of said contact means so as to define a bridge on opposite sides of each contact means solely and flexibly interconnecting said contact means with said pliable sheet.

3,881,800

MULTICOLOR IMAGE MEMORY

Albert A. Friesem, Rehovot, Israel, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Division of Ser. No. 239,594, March 30, 1972, Pat. No. 3,823,412. This application May 30, 1974, Ser. No. 474,782
Int. Cl. G02b *27/02*; **G03b** *21/00*; **G02b** *27/00*
U.S. Cl. 350—3.5 **3 Claims**



1. A method comprising the steps of:

providing an array of a plurality of groups of interleaved photoluminescent segments each group emitting a different one of a plurality of colors,

focusing the emitted light to an image location,

providing at the image location a partially transparent multicolor original image which is to be recorded, and modulating the emitted light in accordance with the intensity of each of the colors of the image to be recorded by passing the radiated light through said partially transparent image,

recording the modulated light pattern on a photosensitive recording surface proximate said original image,

producing a second recording from the photosensitive recording surface and having information content based upon the original image to be recorded,

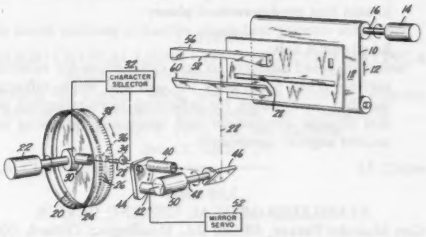
illuminating the second recording with a readout light to cast an image modulated in accordance with the second recording upon an array of photoluminescent segments similar in color emission properties and arrangement to the first mentioned array so that all of the portions of the second recording which contain information about the same color in the original image transmit light to photoluminescent segments all of which emit the same color.

3,881,801

OPTICAL SCANNING SYSTEM

Edwin W. Bechtold, Plandome Manor, N.Y., assignor to Eltra Corporation, New York, N.Y.

Filed Sept. 19, 1973, Ser. No. 398,693
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 **9 Claims**



1. An optical scanning system for arrangement between an object and a light-sensitive medium, said optical system comprising, in combination:

a. an objective for forming an image of the object on the light-sensitive medium, the route of projected light from said object to said image defining an optical path having two ends;

b. first mirror means arranged in said optical path between one end thereof and said objective, said first mirror means being selectively movable about a pivot axis for changing angularly the direction of the portion of said optical path between said one end and said first mirror means, the distance between said one end and said first mirror means thereby defining a radius of scan; and

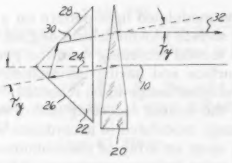
c. second mirror means arranged in said optical path between said one end thereof and said first mirror means, said second mirror means having a curved reflecting surface with a radius of curvature that is substantially twice said radius of scan;

whereby the optical system satisfies the Petzval condition for a flat image surface so that movement of said first mirror means causes said one end of said optical path to move linearly.

3,881,802
WEDGE-PRISM OPTICAL SCANNER

Uuno V. Helava, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 18, 1974, Ser. No. 461,823
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 **21 Claims**



1. An optical scanner for angularly deflecting an incident beam of light in a direction parallel to a determinable plane comprising:

a single refractive member, having an entrance surface, an exit surface angularly disposed to said entrance surface and a longitudinal axis passing through said entrance and exit surfaces, for angularly deflecting the incident beam of light incident on said entrance surface in a straight line through said single refractive member to said exit surface in a direction to generate a deflected beam angularly disposed to the direction of said incident beam, said deflected beam having a first angular component in a direction parallel to a first predetermined plane containing said longitudinal axis and a second angular component in a direction parallel to a second predetermined plane containing said longitudinal axis and perpendicular to said first predetermined plane;

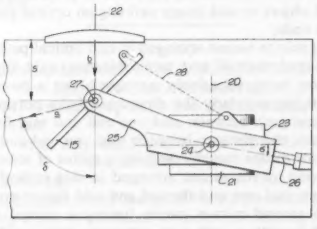
means for rotating said single refractive member about said longitudinal axis;

means disposed adjacent to said exit surface for reflecting said deflected beam back through said single refractive member, said means for reflecting retro-reflecting said first angular component and specularly reflecting said second angular component.

3,881,803
STABILIZED OPTICAL VIEWING DEVICE

Guy Malcolm Parker, 57 Old Rd., Headington, Oxford, OX 3 7 JZ, England

Filed May 22, 1973, Ser. No. 362,799
Claims priority, application United Kingdom, May 25, 1972, 24561/72
Int. Cl. G02b *23/02*
U.S. Cl. 350—16 **9 Claims**



1. An optical viewing device having a line of sight and a parallel viewing direction and comprising

a. an objective lens system having spaced lens elements,

b. a mirror element located to reflect light passing along an optical path between the lens elements,

c. stabilizing means having a frame, an outer gimbal pivotally carried by the frame and carrying the mirror to pivot about a first axis, an inner gimbal carried by the outer gimbal to pivot about a second axis substantially parallel to said first axis, and a body carried by the inner gimbal, said body tending to maintain an alignment in space parallel to the line of sight,

d. a link between the mirror element and the inner gimbal such that their respective angular movements relative to the outer gimbal are in the ratio $1 : r$, the arrangement being such that $1 - (2/r) + (2s/fr) = 1/m$

where

s is the distance along the optical axis between the reflecting surface and that part of the objective lens system that lies in front of the reflecting surface;

f is the focal length of that part of the objective lens system that lies in front of the reflecting surface; and

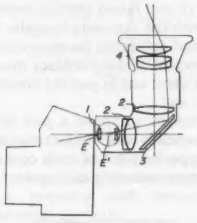
m is the overall magnification of the complete optical system of the device;

whereby the image produced by the device is stabilized in space against vibration leading to movement of the device about an axis perpendicular to the line of sight.

3,881,804
COMPACT ANGLE FINDER WITH ADJUSTABLE MAGNIFYING LENS SYSTEM

Yoshitsugu Ikeda Hachioji, Tokyo, Japan, assignor to Olympus Optical Company Limited

Filed May 16, 1973, Ser. No. 360,949
Claims priority, application Japan, May 23, 1972, 47-50985
Int. Cl. G02b *23/14*
U.S. Cl. 350—49 **3 Claims**

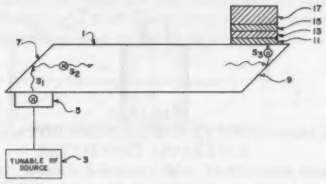


1. A compact angle finder for single-lens reflex cameras comprising a single-lens reflex camera and an angle finder arranged at the rear of an eyepiece of said single-lens reflex camera and consisting of a Galilean type rotatably adjustable magnifying lens system, an objective lens system divided into two positive components bounding an air space therebetween, a reflecting member disposed in said air space, and an eyepiece lens system composed of two positive components, both said objective lens system and said eyepiece lens system being arranged at the rear of said magnifying lens system, and in which an entrance pupil of said adjustable magnifying lens system substantially coincides with an exit pupil of said eyepiece of the single-lens reflex camera finder, an exit pupil of said adjustable magnifying lens system is located within a range which is about one-half the overall length of said adjustable magnifying lens system from the center of rotation thereof and at the same time said exit pupil coincides with an entrance pupil of a lens system consisting of said objective lens system and said eyepiece lens system.

3,881,805
ACOUSTIC TERMINATIONS FOR ACOUSTICALLY TUNED OPTICAL FILTERS

John D. Larson, III, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 18, 1974, Ser. No. 434,530
Int. Cl. G02f 1/24
U.S. Cl. 350—149 3 Claims



1. An acoustic terminator for an acousto-optic filter comprising:

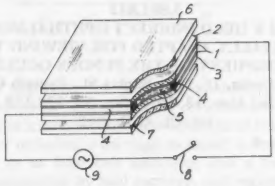
a metallized adhesive layer on the surface of the filter; and

a mass of lead/gold alloy on the adhesive layer, the alloy having a composition by weight of lead to gold in the range 50/50 to 100/0.

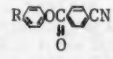
3,881,806
ELECTRO-OPTICAL DISPLAY DEVICE

Toshihiro Suzuki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 13, 1973, Ser. No. 378,852
Claims priority, application Japan, July 13, 1972, 47-69526
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 9 Claims



1. In an electro-optical display device, the combination comprising a liquid crystal composition including at least one compound having the formula

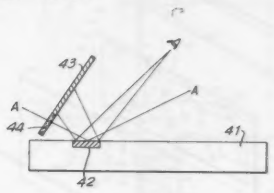


where R is a radical selected from the group consisting of alkyl, alkoxy and acyloxy radicals, each radical containing from 1 to 10 carbon atoms; a pair of opposed transparent plates each having a transparent conductive film on the interior surface thereof, between which said composition is held as a thin layer, said conductive films being connectable to a voltage source; and a pair of light-polarizing members disposed proximate the exterior surfaces of each of said transparent plates, the optical axes of said light-polarizing members being so related to each other that imposition and removal of an electric field across said liquid crystal composition substantially alters the transmission of light through said device.

3,881,807
LIQUID CRYSTAL DISPLAY FOR SMALL-SIZED ELECTRONIC CALCULATOR

Minoru Hosokawa, and Kouji Kakizawa, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 197,379, Nov. 10, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,315
Claims priority, application Japan, Nov. 12, 1970, 45-111928
Int. Cl. G02f 1/28; G08b 23/00
U.S. Cl. 350—160 LC 3 Claims

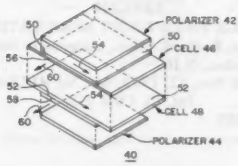


1. In a small-sized electronic calculator, the improvement which comprises liquid crystal display means having a display surface disposed on said calculator; and cover means pivotally mounted on said calculator for displacement between a first position in which said cover overlays said liquid crystal display surface, the second position in which said cover is positioned to intercept light reflected from said liquid crystal display surface relative to the eye of the observer, said cover further including a transparent plate proximate the viewing surface of the calculator to provide light from behind the cover to thereby enhance the contrast of said display device to the eye of the observer.

3,881,808
LIQUID CRYSTAL LIGHT CONTROL DEVICE HAVING A HIGH TRANSMISSION EFFICIENCY

Richard W. Gurtler, Mesa, and Reuben Wechsler, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 7, 1973, Ser. No. 422,953
Int. Cl. G02f 1/28
U.S. Cl. 350—160 LC 14 Claims



1. A light control device including in combination:

first polarizer means polarized in a predetermined direction;

first twisted nematic liquid crystal cell with a first surface juxtapositioned along said first polarizer means and a second surface, said first liquid crystal cell having liquid crystal material with selectively oriented molecules interposed between said first and second surfaces thereof;

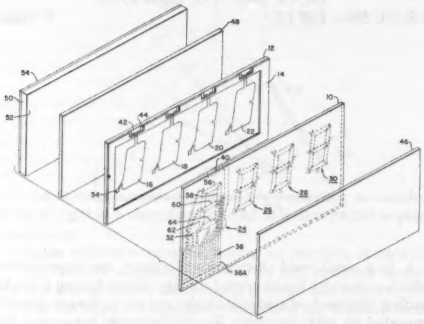
second twisted nematic liquid crystal cell with a first surface juxtapositioned along said second surface of said first liquid crystal cell and a second surface, said second liquid crystal cell having liquid crystal material with selectively oriented molecules interposed between said first and second surfaces thereof; and

second polarizer means juxtapositioned along said second surface of said second liquid crystal cell, said second polarizer means being polarized in another predetermined direction.

3,881,809
REFLECTION SYSTEM FOR LIQUID CRYSTAL DISPLAYS

James L. Fergason, Kent, and Thomas B. Harsch, Stow, both of Ohio, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 233,678, March 10, 1972, abandoned. This application May 25, 1973, Ser. No. 364,027
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 9 Claims

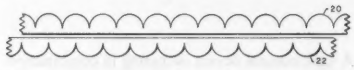


1. A liquid crystal display comprising a layer of liquid crystal material disposed between first and second transparent parallel plates to provide a sandwich structure through which light can pass, said plates being coated on only selected areas thereof with films of transparent conductive material, means for polarizing light passing through said transparent plates and said liquid crystal layer, means for establishing a potential difference between films on the respective plates such that some areas of the sandwich structure will transmit light while others will not to thereby form an optical image, and reflector means adjacent one of said plates and adapted to reflect polarized light which has passed through the liquid crystal material back through the liquid crystal material, said reflector means comprising a third transparent plate having a diffuse surface on one side adjacent said one plate and a reflective surface on its other side.

3,881,810
LARGE FIELD LIGHT MODULATOR

Angelo A. Colao, Bedford, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 12, 1973, Ser. No. 415,048
Int. Cl. C02f 1/30
U.S. Cl. 350—285 9 Claims

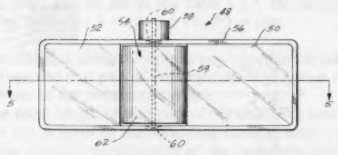


1. A modulator for an extended radiation source, comprising:
- a lens array disposed outside the radiation source to concentrate the radiation to form a predetermined energy distribution pattern, the curved surface of said lens array facing the radiation source;
- means disposed outside said lens array for modulating said energy distribution pattern said modulated energy distribution pattern being radiated through said modulating means at certain positions thereof relative to said lens array; and
- means for causing relative motion between said lens array and said modulating means.

3,881,811
WIDE-ANGLE REAR VIEW MIRROR WITH ROTARY CENTER PIECE

Bruce K. French, 850 San Pascual Ave., Los Angeles, Calif. 90042

Continuation-in-part of Ser. No. 119,388, Feb. 26, 1971, abandoned. This application Aug. 8, 1974, Ser. No. 495,634
Int. Cl. G02b 5/08
U.S. Cl. 350—289 7 Claims

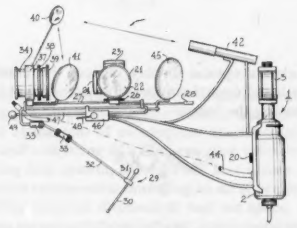


1. A rear view mirror for vehicles comprising:
- first, second, and third reflective portions forming an essentially continuous reflective surface, the first and third portions being flat planar surfaces, the second portion having a cylindrically curved surface of a predetermined length, the second portion being located intermediate the first and third portions, but closely spaced relative thereto so as to form the equivalent of a continuous reflective surface;
- means for rotating the second portion of the mirror about an axis located between and generally parallel to the ends of the flat first and third portions of the mirror, the second portion of the mirror being rotatable at such a speed of rotation that the second portion, in combination with the first and third portions, provides an essentially continuous, unbroken reflection to a viewer in the vehicle; and
- means for mounting the mirror defined by the first, second, and third reflective portions in a vehicle.

3,881,812
MANUALLY HELD INDIRECT OPHTHALMOSCOPE ESPECIALLY ADAPTED FOR VIEWING THE PERIPHERY OF THE FUNDUS OCULI

Nathan Ben-Tovim, 16, Pney-Hagiva St., Ramath Gan, Israel

Filed Mar. 13, 1972, Ser. No. 234,178
Int. Cl. A61b 3/12
U.S. Cl. 351—6 8 Claims



1. An indirect ophthalmoscope comprising:
- a tubular portion to be held in the physician's hand containing a light source for projecting a beam of light;
- a head portion attached to said tubular portion containing an observation hole through which the eye of the patient is examined and a movable reflecting means for reflecting the light beam from the light source into the eye of the patient being examined, the path of movement of said reflecting means being constrained to a rectilinear path perpendicular to the line of sight of the physician to the

eye of the patient, said movement not affecting the direction and angular inclination of the projected light rays which remain parallel to the line of sight;

an attachment means secured at one end to said tubular portion, the opposite end being free for resting on the face of the patient to be examined;

a track disposed upon said attachment means;

a convex lens disposed in said line of sight for viewing the fundus of the examined eye, said convex lens being movable on said track along the long of sight; and,

mirror means positioned between the free end portion of said attachment means and said convex lens for receiving the reflected light from the periphery of the fundus and for transmitting said reflected light along said line of sight.

3,881,813

HOLDER FOR MICROFORMS IN MICROIMAGE RETRIEVING APPARATUS

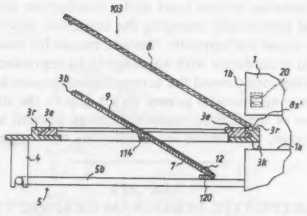
Albert Maier, Munich; Günther Lüder, Taufkirchen, and Josef Pfeifer, Unterhaching, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 20, 1973, Ser. No. 353,134

Claims priority, application Germany, Apr. 28, 1972, 2220923

Int. Cl. G03b *21/11, 23/08*

U.S. Cl. 353—27 **8 Claims**



1. In an apparatus for retrieving microimages which are stored on sheet-like microforms, a combination comprising a housing for at least one projection lens; and at least one microform holder including a carriage mounted in said housing for movement in at least one direction, and a flat receptacle separably supported by said carriage, said receptacle including a microform supporting light-transmitting base plate, a frame and an apertured bottom wall mounted in said frame for pivotal movement about an axis located in the general plane of said base plate, said base plate being mounted in and being pivotable with said bottom wall.

3,881,814

SLIDE ORIENTING DEVICE

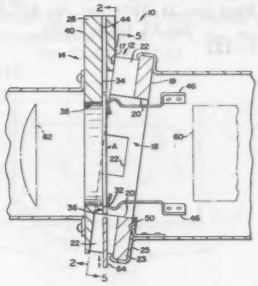
Frank J. Madison, II, R.D. 1, Box 285, Trafford, Pa.

Filed June 12, 1972, Ser. No. 261,625

Int. Cl. G03b *1/48, 23/00, 23/14*

U.S. Cl. 353—95 **12 Claims**

1. A slide orienting device of the type primarily used with a slide projector, said device comprising: a movably mounted slide support bracket means, a slide retainer means, said slide retainer means and said slide support bracket means cooperatively engaging a slide transparency in viewing alignment with the lens and light source of the slide projector, said slide support bracket means including an aperture formed therein and configured to cooperatively engage in supporting relation thereto at least a portion of the slide transparency such that said transparency is properly oriented for viewing; orienting means to move said slide support bracket means relative to the slide projector to selectively orient the slide transparency, and



removal means disposed to remove the slide transparency from said device.

3,881,815

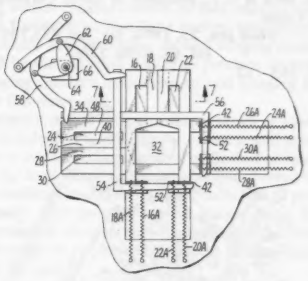
PROJECTION TEACHING MACHINE

Thomas K. McGourty, 16440 Cox Rd., Aptos, Calif. 95005

Filed Dec. 11, 1972, Ser. No. 313,867

Int. Cl. G03b *21/14*

U.S. Cl. 353—97 **5 Claims**



1. A focal plane shutter, said shutter comprising in combination:

a. means defining a focal plane,

b. a first pair of leaves, each leaf of which is mounted in side-by-side sliding relationship at one side of the means for defining the focal plane, each of which leaves is capable of occulting a rectangular area of the focal plane when in an extended position, and permitting light to pass through said focal plane when in a retracted position,

c. a second pair of leaves of substantially the same configuration as said first pair, said second pair being mounted at right angles to said first pair and also at one side of the means defining the focal plane,

d. means for selectively activating leaves of said first and second pairs of leaves to reveal a desired area of said focal plane, and

e. each of said leaves having a sliding member mounted on one edge thereof and having a light obscuring member extending from said sliding member including means whereby said leaves are supported throughout their entire lengths by said sliding member.

3,881,816

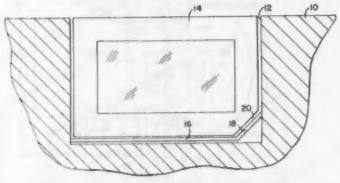
SLIDE PROJECTOR KEYING DEVICE

Andrew H. Jenkins; Robert L. Morgan; Raymond P. Bennett, and Charles E. Dugas, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 21, 1974, Ser. No. 435,346

Int. Cl. G03b *21/00*

U.S. Cl. 353—122 **1 Claim**



1. In combination with a slide projector having a slide slot into which slides to be projected are inserted the improvement which comprises,

a metal strip adapted to be placed in the bottom of said slot, one end of said metal strip being turned up at an angle to the remainder of said strip whereby only slides having a corner clipped and properly oriented can be fully inserted into said slide slot.

3,881,817

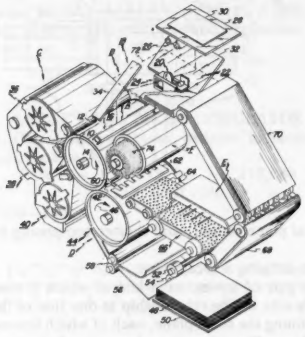
OPTICAL ALIGNMENT SYSTEM FOR AN ORIGINAL DOCUMENT

Wayne L. Kidd, Fairport, and Theodore W. Thomas, Henrietta, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 23, 1974, Ser. No. 435,789

Int. Cl. G03b *27/62*

U.S. Cl. 355—12 **12 Claims**



1. An optical system, including:

a support member arranged to hold an original document;

means for projecting a grid light image onto said support member so that the original document may be aligned on said support member relative to the grid light image projected thereon;

means for creating a light image from the aligned original document disposed on said support member after deenergizing said grid light image projecting means; and

at least one substantially non-light absorbing strip adapted to be positioned on said support member in a selected region of the grid projected thereon to mask a predetermined portion of the original document, said opaque strip having additional indicia thereon adapted to be inserted into the original document.

3,881,818

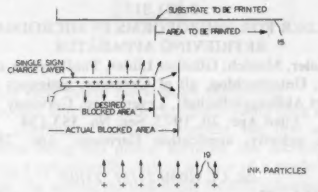
APERTURE-CONTROLLED ELECTROSTATIC PRINTING SYSTEM AND METHOD EMPLOYING ION PROJECTION

Samuel B. McFarlane, Jr., 11 Twombley Dr., Summit, N.J. 07901; Joseph Burdige, 17 Nansen Ct., Spring Valley, N.Y. 10977, and Norman E. Alexander, 24 Morris Ln., Scarsdale, N.Y. 10583

Continuation of Ser. No. 167,011, July 28, 1971, which is a division of Ser. No. 709,578, March 1, 1968, Pat. No. 3,645,614. This application Dec. 12, 1973, Ser. No. 423,984

Int. Cl. G03g *17/00*

U.S. Cl. 355—17 **19 Claims**



1. Apparatus for electrostatic reproducing comprising in combination composite screen means supported for movement along a predetermined path, said screen means comprising an insulative screen layer and a conductive screen layer; means for electrically charging the insulative layer with substantially equal and opposite charges; means for modifying the charges in accordance with an image to be reproduced; means for directing ions toward the screen means; means for locating print receiving material across an air gap in the direction of projection of the ions to receive a charge pattern in the form of said image; and means for developing the image.

3,881,819

CASSETTE-TYPE HOLOGRAM GRAPHIC TABLET

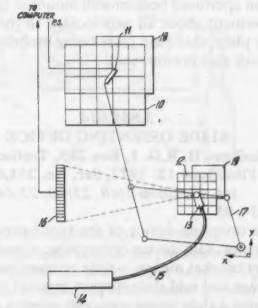
Isamu Hirabayashi; Mitsuhito Sakaguchi, and Masahiro Moriwaki, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 14, 1973, Ser. No. 415,516

Claims priority, application Japan, Nov. 22, 1972, 47-133920

Int. Cl. G03b *27/00*

U.S. Cl. 355—2 **3 Claims**



1. Mounting apparatus for holding a demountable plate in a predetermined position within a housing including

a frame comprising a thin member having two substantially parallel major surfaces and an aperture extending there-

through in a direction perpendicular to said major surfaces,

means for fixedly mounting said plate within said aperture in a plane parallel to said major surfaces of said member, a housing for holding said member having a slot-like aperture extending into said housing, said slot-like aperture being configured so that said member is insertable into said housing in a direction parallel to said major surfaces,

guide means for guiding said member along a predetermined path within said housing,

positioning means including at least one reference surface mounted within said housing so that said member contacts said at least one reference surface when said member is inserted into said housing, and

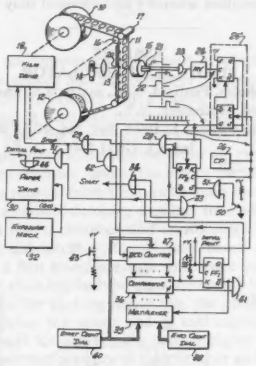
locking means for holding said member firmly against said at least one reference surface to maintain said plate in said predetermined position, said locking means including at least one electromagnet and means to activate said electromagnet in response to pressure exerted by said member against said at least one reference surface.

3,881,820

CONTROL SYSTEM FOR AUTOMATIC REEL-FILM ENLARGER PRINTER

Max K. Muir, Calabasas, Calif., assignor to Information International, Inc., Los Angeles, Calif.

Filed June 17, 1974, Ser. No. 479,875
Int. Cl. G03b *27/52;* **B65h** *23/18*
U.S. Cl. 355—41 **3 Claims**



1. In a control system for automatically printing a sequence of frames stored on a reel of film in response to marks sensed on the film, said sensed marks producing mark pulses, one for each frame, said mark pulses stopping a film drive mechanism and actuating a mechanism for printing a frame, said printing mechanism emitting a go signal to automatically restart said film drive mechanism to advance film to the next frame, means for causing only alternate frames to be printed comprising

a gate means for transmitting said mark pulses to said film drive mechanism and printing mechanism,

a bistable means for enabling said gate means while in a first of two stable states,

means for transmitting said go signal to said bistable means to set it in a second state, thereby causing said gate means to block the next mark pulse, and

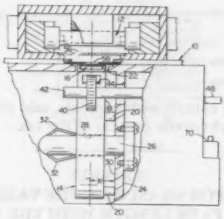
means for transmitting said mark pulses to said bistable means for resetting said bistable means to said first state.

3,881,821

APPARATUS AND METHOD ESPECIALLY USEFUL IN LABEL MAKING

Roby Byron White, Cumberland, R.I., and Frederic Samuel Tobey, Hyde Park, Mass., assignors to W. H. Brady Co., Milwaukee, Wis.

Continuation-in-part of Ser. No. 122,764, March 10, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 346,880
Int. Cl. G03b *27/72*
U.S. Cl. 355—115 **6 Claims**



1. Imaging apparatus for delivery of light energy at a predetermined continuing rate (joules/unit time) for a predetermined length of time to produce images of a predetermined density at a predetermined rate which comprises:

means to position an imaging medium responsive to light, to produce an image of density dependent upon the quantity of light to which said medium is exposed,

a source of light including a flashtube positioned for exposing said imaging medium, said flashtube being of energy rating low relative to the energy required to produce said images,

an imaging master located relative to said imaging medium and said flashtube so that light energy emanating from said flashtube amd impinging on said imaging medium is modified by said imaging master to produce an image in said imaging medium responsive to said imaging master and said flashtube, and

circuitry control means for providing a series of lower energy level pulses to said flashtube for each said image, to produce a corresponding number of flashes of said light energy, the total quantity of light energy delivered to said imaging medium in said series being sufficient to produce said density, said circuitry control means being further characterized in that successive series may be initiated rapidly enough to produce further heat buildup from one series to the next.

3,881,822

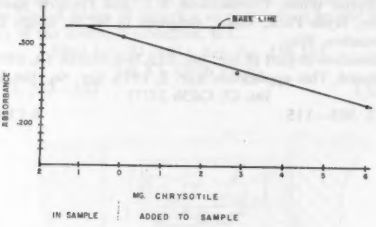
METHOD FOR DETERMINING CHRYSOTILE (ASBESTOS) IN THE TALC

Harry A. Rose, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 26, 1973, Ser. No. 427,778
Int. Cl. G01n *21/22*
U.S. Cl. 356—36 **12 Claims**

1. A method for determining the chrysotile content of talc comprising: first, contacting said chrysotile containing talc with a solution of a sulfonphthalein dye selected from the class consisting of bromphenol blue, bromthymol blue, bromcresol green, bromcresol purple, cresol red, and thymol blue, and measuring the optical absorbance of said solution both before and after contact with said talc; second, contacting at least two additional samples of said talc, to which additional differing accurately weighted quantities of chrysotile have been added, with a solution of said sulfonphthalein dye, and measuring the absorbance of each of said dye solutions after said contact; third, graphically relating on an arithmetic scale the quantity of chrysotile added to said talc to the absorbance thus measured; and fourth, extrapolating a negative regression line

through the points located on said graph to an intersection with a baseline representing the optical absorbance of said dye



solution before contact with such talc, said intersection point indicating the chrysotile content of the talc.

3,881,823

APPARATUS FOR MEASURING THE VARIATION OF AN OPTICAL PATH LENGTH WITH THE AID OF AN INTERFEROMETER

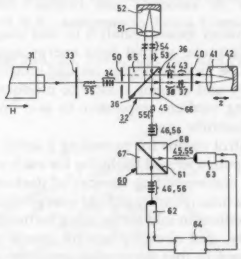
Hendrik De Lang, Delft, and Eric Tapley Ferguson, Emmasingel, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 733,341, May 31, 1968, abandoned. This application Nov. 12, 1970, Ser. No. 89,090

Claims priority, application Netherlands, June 2, 1967, 6707681

Int. Cl. G01b *9/02*

U.S. Cl. 356—106 R **3 Claims**



1. A device for measuring the variation of a variable optical path length, comprising optical generating means for producing two orthogonally polarized coherent beams of electromagnetic radiation having different frequencies, a substantially isotropic beam splitting surface for dividing said beams into first and second partial beams each containing both oo said different frequencies, first reflecting means in the path of the first partial beam for redirecting said first partial beam, second reflecting means movable in the direction of the second partial beam and positioned in the path of the second partial beam for redirecting said second partial beam, a phase anisotropic element in the path of at least one of said partial beams for rotating the plane of polarization of the corresponding partial beam by an angle equal to an odd multiple of 90°, a first photodetector, and a polarization-sensitive beam splitter in the path of both redirected partial beams for transmitting at least part of each sub-beam to the first photodetector and for directing a further portion of the radiation from the polarization-sensitive beam splitter to the second photodetector, the portion of the radiation directed to the second photodetector having a plane of polarization substantially orthogonal with respect to the radiation directed to the first photodetector, the radiation directed to each photodetector containing both frequencies produced by the optical generating means.

3,881,824

ALIGNMENT AND CONTROL SYSTEM

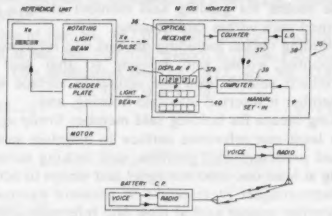
John Higgins, Arlington, Va., assignor to Minister of National Defence, Ottawa, Canada

Filed Mar. 2, 1973, Ser. No. 337,370

Claims priority, application Canada, Mar. 17, 1972, 137317

Int. Cl. G01b *11/26*

U.S. Cl. 356—141 **12 Claims**



1. An azimuth alignment system comprising a reference unit adapted to be aligned in a known orientation; a revolving means on said reference unit for providing a highly collimated light beam; a beacon for emitting pulsed radiation; an angular encoder connected with said revolving means for causing the beacon to signal incremental angular movement of, and the passing of a datum position by, the revolving means;; a receiver means for mounting on an element to be aligned in azimuth, said receiver means having means to detect the highly collimated light beam and to receive and interpret the pulsed radiation from the beacon, and therefrom to provide azimuth information whereby said element may be aligned.

3,881,825

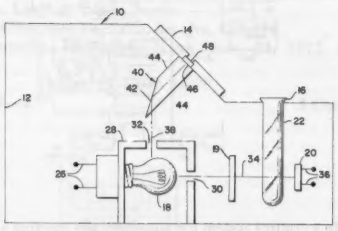
PILOT LIGHT SIMULATOR

James J. Chisholm, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,720

Int. Cl. G01j *1/44*

U.S. Cl. 356—227 **1 Claim**



1. An operating indicator used in a photometer, comprising:

a housing for encompassing the elements of a photometer;

a light source disposed within said housing for providing the necessary illumination for a photometric test;

means for supplying electrical power to said light source and capable of activating and deactivating said photometer simultaneously with said light source;

switching means for activating and deactivating the electrical power when supplied by said power supplying means;

a cover enclosing said light source having first and second apertures provided therein, a first light path for taking the photometric test being formed by light passing through the first aperture and a second light path for indicating the activation of said light source being formed by light passing through the second aperture; and

a bezel located on said housing, a colored translucent element disposed in said bezel for aiding in observing the activation of said light source and a prism connected to said bezel for reflecting light from said second light path to impinge on said colored translucent element.

3,881,826

PHOTOMETER CHAMBER UNIT

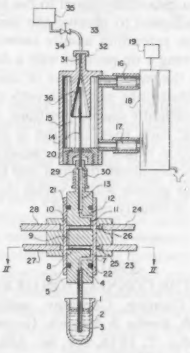
Jan De Leeuw, Akersberga, Sweden, assignor to Auto Chem Instrument Aktiebolag, Lidiago, Sweden

Filed Dec. 20, 1973, Ser. No. 426,588

Claims priority, application Sweden, Dec. 20, 1972, 16663/72

Int. Cl. G01n *1/14*

U.S. Cl. 356—246 **9 Claims**



1. In a photometer chamber unit in which a liquid to be analyzed is sucked into a photometer chamber, said unit comprising a channel system with a pipette tube for insertion into a liquid, and at least one photometer chamber which is to be passed by light, the improvement wherein the channel system is one single unbranched channel from the pipette through the photometer chamber, and at the end of the unbranched channel system remote from the pipette tube the channel system ends with a vertical damping capillary tube which extends into and opens into a chamber and constitutes a continuation of said single unbranched channel, and means are provided for achieving a first lower pressure difference between the pressure in the chamber and the pressure on the liquid around the pipette tube for sucking liquid into the channel system only until it reaches the upper end of said capillary tube in said chamber, and for achieving a second higher pressure difference between the pressure in the chamber and the pressure on the liquid around the pipette tube for emptying the liquid from the channel system and into the chamber.

3,881,827

FLOW CELL

Saul R. Gilford, Oberlin; Gary M. Freeman, Grafton, and John H. Bauman, Berea, all of Ohio, assignors to Gilford Instrument Laboratories, Inc., Oberlin, Ohio

Division of Ser. No. 332,929, Feb. 16, 1973, Pat. No. 3,820,530. This application Jan. 11, 1974, Ser. No. 432,476

Int. Cl. G01n *1/10*

U.S. Cl. 356—246 **3 Claims**

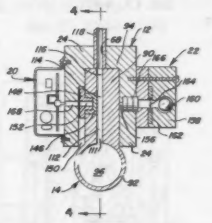
1. A cuvette for use in dye-dilution techniques requiring densitometry and comprising:

A. a block of transparent material,

B. a cavity formed in said block in the center thereof and opening to the side of said block and configured to form a cuvette for passage of light in a path from side to side of the block and passage of fluid from end to end of the block transverse of said path,

C. passageways from opposite ends of said block connected to the cuvette to transport fluid through said cuvette,

D. a plug of transport material in said cavity and having its inner surface defining one surface of said cuvette normal to said path, said plug having a cylindrical bore therethrough stopping short of said inner surface, and



E. a button of opaque material having a disc-like head and stem with a central axial light passageway through the head and stem, the stem being engaged in the bore of the plug with the head overlying the side around said cavity with the light passageway aligned with said path.

3,881,828

PENS AND NIBS THEREFOR

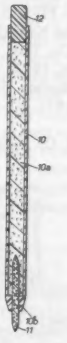
Frederick O. Jones, Bracknell, England, assignor to Wilkinson Sword Limited, High Wycombe, Buckinghamshire, England

Filed July 12, 1973, Ser. No. 378,619

Claims priority, application United Kingdom, July 18, 1972, 33436/72

Int. Cl. B43k *5/00*

U.S. Cl. 401—199 **9 Claims**



1. A pen nib composed of a relatively rigid, ink-permeable metal foam material, said foam material having an open-cell structure, said structure having apertures between the cells, said apertures constituting the pores of the structure.

3,881,829
CONNECTIONS BETWEEN STRUCTURAL COMPONENTS

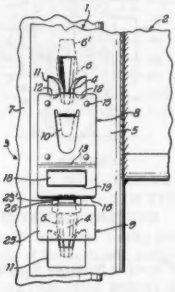
John Brian James, Wembley, England, assignor to Dexion-Comino International Limited, Wembley, Middlesex, England

Filed Nov. 27, 1973, Ser. No. 419,470

Claims priority, application United Kingdom, Nov. 27, 1972, 54723/72

Int. Cl. A47f *5/10*

U.S. Cl. 403—27 **5 Claims**



1. Locking means for interconnecting structural members comprising in combination:

means on a first of said members detachably engaging a recess in another of said members for supporting a load acting between said members in a predetermined direction,

a U-shaped projecting member formed of a frangible material on one of said members and detachably engaging with a cooperating means on the other of said members,

said cooperating means exerting a force against the legs of said U-shaped member acting in a direction tending to bend at least one leg portion thereof against the other, whereby at least one leg portion of said U-shaped member fractures.

3,881,830
COMBINATION PIPE JOINT STRUCTURE

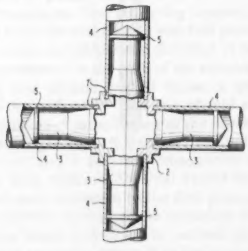
Katsumi Kato, Kyoto, and Naoaki Sato, Shiga, both of Japan, assignors to Takiron Co., Ltd., Osaka-shi, Osaka, Japan

Filed Sept. 26, 1973, Ser. No. 400,989

Claims priority, application Japan, Sept. 26, 1972, 47-114119[U]; Mar. 12, 1973, 48-32190[U]; Mar. 12, 1973, 48-32191[U]

Int. Cl. F16b *7/00*

U.S. Cl. 403—171 **1 Claim**



1. A combination pipe joint structure comprising:

a pair of complementary pipe joint half units, each having a joint surface for being joined thereat to each other to form a unitary structure, each of said pipe joint units including a base portion and a plurality of foot portions extending from said base portion on said joint surface and angularly spaced from each other,

complementary foot portions forming cylindrical feet, each of said foot portions having an outer peripheral surface sized and shaped to fixedly hold thereon a pipe when its corresponding halves are joined to each other and when it is subsequently fitted into the pipe, so that a plurality of pipes of the same number as that of the foot portions may be joined to each other,

at least one of said pipe joint units further including at least one other foot extending from the base portion at an angle from the joint surface, each foot of said combination pipe joint structure being cylindrical in form including a first outer peripheral surface portion near the base of a diameter substantially equal to the inner diameter of the pipe and adapted to receive the same and having a tapered portion extending axially outwardly therefrom, and further having a tip portion with a diameter substantially equal to the inner diameter of said pipe, whereby said pipe is fitted onto said foot with contact therebetween at longitudinally spaced positions, and wherein said base portion at each foot location is provided with an annular projection which extends radially outward therefrom concentrically about the foot and forming with said foot, an annular groove within which the end of a corresponding pipe is fittedly received.

3,881,831
COUPLING FOR THE CONNECTION OF ROTARY PARTS

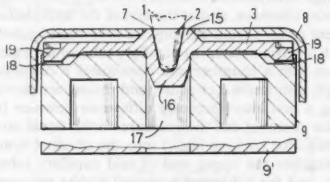
Egon Reithmaier, Gauting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 7, 1974, Ser. No. 448,875

Claims priority, application Germany, Mar. 7, 1973, 2311296

Int. Cl. F16d *1/00*

U.S. Cl. 403—180 **6 Claims**

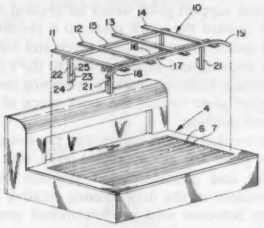


6. An adjustable pot core arrangement including two core halves having a common concentric axis, and means for adjusting the inductance of the pot core arrangement by relative rotation of the two core halves about that common axis, each of said core halves including an aligned central bore therein, a rotatable pressure disc disposed adjacent a first of said core halves, said pressure disc and said first core half having cooperable means constructed for interlocking engagement whereby rotation of said disc is transmitted to said first core half, a spring clip embracing said core halves and said pressure disc and arranged to bear on said pressure disc to retain said core halves and said disc in operative positions, said pressure disc including a shoulder extending axially therefrom and engaging said spring and said shoulder having a shaped recess therein to receive a correspondingly shaped adjusting shaft, said shoulder responsive to depression of the shaft in the recess to disengage from said spring clip and permit rotation of said first cup core half with respect to the other cup core half upon rotation of the shaft.

3,881,832
LOW PROFILE PROTECTIVE INSERT FOR SEWERS

Harry A. Maguire, 37343 Carleen Ave., Avon, Ohio 44011

Filed May 16, 1974, Ser. No. 470,389
Int. Cl. E01c *11/22*
U.S. Cl. 404—4 14 Claims



1. A protective insert for sewer gratings, which include a plurality of substantially parallel interstitial wall dividers being substantially coplanar at the upper edges thereof and defining a plurality of longitudinal openings therebetween, comprising:

a plurality of cross members, said cross members being substantially coplanar and parallel with respect to each other for positioning in overlying relation on the upper edges of the wall dividers of such a sewer grating for support thereby;

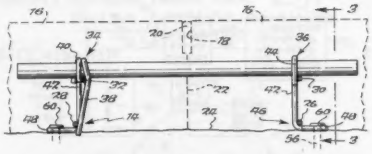
means for connecting said cross members together in such substantially coplanar and parallel relation, said means for connecting including at least one longitudinal member positioned between said cross members, extending perpendicularly thereto, and adapted for positioning completely within one of said longitudinal openings; and

means for attaching said insert to a sewer grating.

3,881,833
LOAD TRANSFER ASSEMBLY

Richard G. McMullen, Fayetteville, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed June 24, 1974, Ser. No. 482,331
Int. Cl. E01c *11/14*
U.S. Cl. 404—60 10 Claims

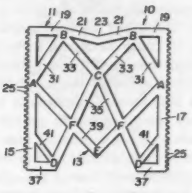


1. A load transfer support means comprising: a frame including at least one pair of opposed, spaced apart generally upright members; one of said upright members having means for gripping an end portion of a dowel against axial movement relative thereto; the other end of said upright members having means for gripping the other end portion of a dowel in one position thereof; said other member releasing the dowel for guided movement relative thereto in another position thereof; said frame normally biasing said other member into said one position.

3,881,834
JOINT SEALS

Thomas C. Bowman, 49 Arkansas St., Buffalo, N.Y. 14213

Continuation of Ser. No. 171,157, Aug. 12, 1971, abandoned.
This application May 10, 1973, Ser. No. 359,140
Claims priority, application Australia, Aug. 20, 1970, 2263/70; Aug. 20, 1970, 2264/70
Int. Cl. E04c *11/10*
U.S. Cl. 404—64 2 Claims



1. An elongated, flexible, resilient, hollow sealing member for sealing an expansion or contraction joint comprising: a pair of spaced, substantially parallel side walls, a top wall, a bottom wall, and an internal network of reinforcing webs, said walls and network being integral; said top wall being joined to said side walls and having adjacent its ends plural straight, continuous, inwardly extending portions substantially normal to said side walls and downwardly sloping central portions connected to the inner ends of said straight portions and forming a single, central trough; said internal network including (1) a first V-shaped web terminating at its respective ends in said side walls intermediate the ends thereof and substantially below the junction of said side wall with said top wall and extending downwardly with the apex of said V located midway between said side walls and above the lower ends of said side walls, (2) a pair of outwardly diverging webs extending downwardly from a junction located midway between said side walls and between said apex and said top wall and intersecting said first V-shaped web, and (3) a pair of outwardly diverging webs extending upwardly from said junction and connected to said top wall between said trough and said side walls; and said bottom wall comprising (1) a pair of supporting webs, each connected to one of said side walls at the lower ends of the latter, each of said supporting webs extending inwardly at right angles from said side walls to a junction with one of said downwardly and outwardly extending webs, (2) the portions of said downwardly and outwardly extending webs below their intersections with said first V-shaped web, and (3) the portion of said first V-shaped web lying between the intersections thereof with said downwardly and outwardly extending webs; there being no vertical web tying together the junction of said downwardly and outwardly extending webs and said first V-shaped web.

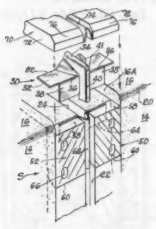
3,881,835
SIDEWALK-CURB SEALING MEMBER, ASSEMBLY AND METHOD

John C. Moerk, Jr., Buffalo Grove, and Donald W. Malina, Des Plaines, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Filed June 6, 1973, Ser. No. 367,464
Int. Cl. E01c *11/10*
U.S. Cl. 404—64 20 Claims

1. A corner sealing member for sealing a portion of a gap between adjacent roadway slabs at the intersection of curb and sidewalk portions thereof, said member being formed of a thin, flexible elastomeric material, and comprising a pair of

first, generally flat coplanar expansive sealing flaps, one extending sidewardly from each side of a first central, flexible membrane which is adapted to overlie a portion of a said gap, a pair of second, generally flat expansive sealing flaps, formed with said first flaps at front edges of said first flaps and extending downwardly and away from said first flaps, one of said second flaps extending sidewardly from each side of a second flexible membrane which is adapted to overlie a portion of a said gap, said first and second membranes being continuous



and merging into each other to form a corner, each of said membranes terminating forwardly in an end face, the end faces closing the forward ends of the membranes, respectively, and with said membranes forming said corner, said end faces being disposed to promote movement of the end faces toward and away from each other when the gap portion widens and narrows, whereby when a said corner member is sealingly secured to roadway slab portions to overlie a portion of a gap adjacent the intersection of curb and sidewalk portions of said slabs, a seal will be provided at a said gap portion.

3,881,836

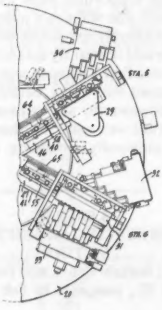
APPARATUS FOR SIMULTANEOUSLY DRILLING AND TAPPING A PLURALITY OF WORK PIECES AT EACH OF A PLURALITY OF POSITIONS

Nils Hoglund, Short Hills, N.J., assignor to Tri-Ordinate Corporation, Berkeley Heights, N.J.

Continuation of Ser. No. 247,572, April 26, 1972, which is a division of Ser. No. 118,218, Feb. 24, 1971, which is a division of Ser. No. 763,043, Sept. 9, 1968, abandoned. This application Sept. 10, 1973, Ser. No. 395,760

Int. Cl. B23b *39/16*

U.S. Cl. 408—42 **1 Claim**



1. An assembly for supporting a plurality of parallel tool supporting spindles including:

a. a base;

b. a housing slidably mounted on said base, said housing comprising a tool housing which is slidably mounted on said base and a support plate mounting a guide bushing for each tool, said support plate mounted on the base independently of the tool housing;

c. mechanical means connected between said base and said housing for moving said housing along said base, said mechanical means comprising:

i. selectively operable means for advancing the tool housing and support plate under an applied force along the base toward the work piece to a predetermined position spaced from the work piece and for retracting the drill housing and support plate to their initial position;

ii. motion limiting means for stopping movement of the support plate toward the work piece at said predetermined position;

iii. lost motion means connecting the housing to the support plate for advancement as a unit between said initial and predetermined position but permitting movement of the drill housing relative to the support plate between said predetermined position and the work piece; and

iv. cam stop means disposed in the path of movement of the tool housing at said predetermined position for imparting reciprocal movement to the drill housing to move the tool contained therein into and out of operative engagement with the work piece;

d. a plurality of parallel tool holding spindles on said tool housing;

e. driving pulleys mounted at one end of each of said spindles;

f. idler pulleys spaced from and intermediate said driving pulleys;

g. a main pulley on said housing;

h. a common continuous belt engaging all of said pulleys; and

i. a reversible hydraulic motor connected to said main pulley.

3,881,837

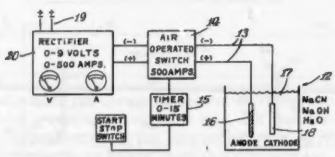
HIGH SPEED STEEL METAL CUTTING TOOL WITH INTEGRAL WORKING SURFACES SUBSTANTIALLY FREE OF CARBIDE PARTICLES

Thomas A. Novosel, East Burke, and Donald O. Erskine, Lyndon Center, both of Vt., assignors to Vermont American Corporation, Louisville, Ky.

Division of Ser. No. 177,338, Sept. 2, 1971, Pat. No. 3,767,544. This application Mar. 6, 1973, Ser. No. 338,602

Int. Cl. B23b *27/14*

U.S. Cl. 408—144 **5 Claims**

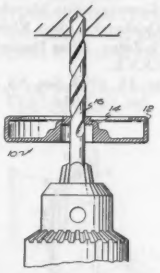


1. A metal cutting tool having a body composed of high speed tool steel comprising carbide particles of minute size dispersed through said body, said body having working surface portions comprising a cutting edge portion and an integral chip-raising surface portion extending from the cutting edge portion, said cutting edge portion being adapted to sever a chip from a metal workpiece, and the chip-raising surface portion being adapted to raise the severed chip from the workpiece, said cutting edge portion and said chip-raising surface portion both being parts of the body off the tool and containing distributed carbide particles and having their abovesaid working surface portions substantially free of exposed carbide particles.

3,881,838
DRILL ATTACHMENT

George C. Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Company, Limited, Sheffield, England

Filed Oct. 25, 1973, Ser. No. 409,578
Int. Cl. B23b 45/00
U.S. Cl. 408—67 4 Claims

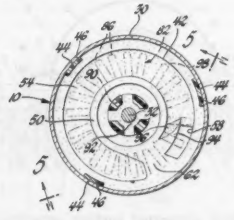


1. A device removably attachable to the shank of a drill bit carried by a chuck of a rotary tool and serving to catch and thereby guard against dust and swarf falling upon the chuck or upon the operator when using the tool in an overhead drilling operation, the device comprising a circular container having a bottom wall, a side wall, a circumferential lip offset radially inward from the top end of the side wall forming a cavern with said bottom and side walls to receive and retain said dust and swarf being swept therein by centrifugal force during said overhead drilling operation and said lip defining an opening in the top end of the container for receiving said dust and swarf, and a bush of flexible resilient material forming a portion of the bottom wall and extending upwardly in the container, the bush having an axially extending hole therethrough of slightly less diameter than the shank of the drill bit with which the device is to be used enabling fitting of the bush upon the shank of the drill bit in gripping relation to the latter, the opening in the top of the container being of a greater diameter than the outer diameter of the bush, and the axial dimension of the container being substantially less than the extent of axial projection of the shank of the drill bit from the chuck.

3,881,839
FUEL PUMP

Daniel C. MacManus, Owosso, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1974, Ser. No. 431,288
Int. Cl. F04d 5/00, 29/70
U.S. Cl. 415—53 T 2 Claims

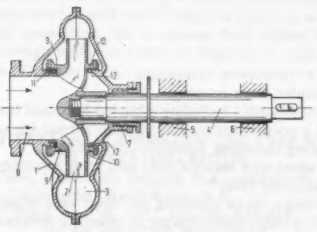


1. In a peripheral fluid pump; the combination of a housing formed in two parts, including a cylindrical casing member and a cylindrical cover member which together define a raceway with a radially outward annular fluid passage means and having confronting side and perpheral stripper abutments in the annular fluid passage means; inlet and outlet ports in said casing member and said cover member, respectively, and positioned on opposite sides of the side peripheral stripper abutments and communicating with the annular fluid passage means to define a fluid flow path from said inlet port to said outlet port; an impeller within the raceway including a hub portion provided with a series of radially extending vanes attached thereto at a base portion; said hub portion having a central drive shaft guideway and drive slots therein spaced circumferentially around the guideway; the casing member having at least two vent openings communicating with the annular fluid passage means near the base portion of the vanes; the first of said vent openings being positioned diametrically opposite from said inlet port and the other vent opening being spaced in a circumferential direction downstream from said inlet port and upstream from said first vent opening whereby a portion of vaporous fluid in said fluid passage means passes through said other vent opening and another portion subsequently passes through said first vent opening; said side stripper abutment adjacent said outlet and on said cover member having partition means extending upstream from said outlet and from said stripper abutment to radially separate fluid flow in said annular fluid passage means into an inward stream adjacent to said base portion of said vanes and a radially outward stream therefrom; said outlet port being located radially outward from said partition to mostly discharge said radially outward stream of fluid in said annular fluid passage means; said side stripper abutment having inclined fluid directing means located radially inward from said partition means for diverting the inner stream of fluid back between said vanes for discharge of vaporous fluid through said vent openings.

3,881,840
CENTRIFUGAL PUMP FOR PROCESSING LIQUIDS CONTAINING ABRASIVE CONSTITUENTS, MORE PARTICULARLY, A SAND PUMP OR A WASTE-WATER PUMPER

Johan Henri Bunjes, Hengelo, Netherlands, assignor to Neratoom B.V., The Hague, Netherlands

Filed Sept. 5, 1973, Ser. No. 394,490
Int. Cl. F04d 29/08, 29/70
U.S. Cl. 415—109 8 Claims



6. In a centrifugal pump assembly, the combination of:

a housing having an inlet opening and an annular delivery chamber; an impeller having an inlet eye aligned with said inlet opening and a peripheral portion discharging to said delivery chamber, said impeller and said housing defining an intermediate chamber therebetween leading to said delivery chamber; and

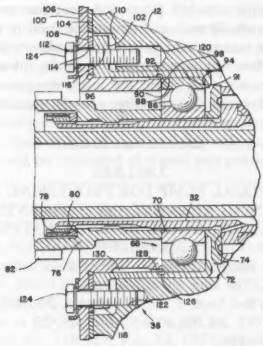
sealing means formed between said housing and said impeller between said inlet opening and said delivery chamber for bleeding liquid from said intermediate chamber to said inlet opening, said sealing means including opposed surface portions of said impeller and said housing defining a sealing slot having an outer end communicating with said intermediate chamber and an inner end communicating with said inlet opening, an annular chamber defined between said surface portions adjacent said outer end of

the sealing slot, and duct means in said impeller leading from said annular chamber to said intermediate chamber for redirecting sediment entering said outer end of the sealing slot back into said intermediate chamber, and wherein said surface portions are defined by an outer sleeve on said impeller and an inner sleeve on said housing, said annular chamber being formed in said outer sleeve.

3,881,841
DAMPED COMPRESSOR BEARING MOUNTING ASSEMBLY

Salvatore Straniti, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Nov. 29, 1973, Ser. No. 420,202
Int. Cl. F01d *25/16;* **F04d** *29/04*
U.S. Cl. 415—131 **9 Claims**

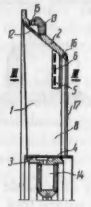


1. In a compressor comprising:
an annular outer housing;
a rotor assembly including a bladed hub, said housing having a portion defining an annular shroud for said hub;
a bearing mounting assembly comprising:
an inner race secured over said rotor assembly
and an outer race;
an outer sleeve receiving the outer race of said bearing, said outer sleeve having an inwardly directed lip defining a first axial face and an outer extending flange;
an inner sleeve telescoped into said outer sleeve and having an end defining a second axial face, said inner sleeve having an outwardly extending flange adjacent the flange on said outer sleeve, said outer race being positioned between said first and second faces;
the improvement comprising:
an assembly for mounting said outer race of said bearing, said assembly including a first annular shim positioned between said flanges, said shim having a given axial thickness for positioning said outer race in said assembly with a predetermined clearance between said first and second axial faces in said assembly, and a second annular shim also having a given axial thickness coaxial with said first shim for positioning said bearing mounting assembly in a predetermined axial position relative to said housing thereby maintaining a predetermined clearance between said shroud and said hub.

3,881,842
DIAPHRAGM FOR STEAM TURBINE STAGE

Jury Fedorovich Kosyak, prospekt Moskovsky 202, kv. 85; Sergei Petrovich Sobolev, pereulok Molchanovsky 7, kv. 5; Ary Fedorovich Rudkovsky, ploschad Tevelva, 2/2, kv. 9; Viktor Vasilievich Ugolnikov, ploschad Teveleva 2/2, kv. 28; Yakov Lvovich Iglinsky, ulitsa Mezhlauka, 9/2, kv. 39; Nikolai Artemovich Babadzhanian, ulitsa Ganny, 44, kv. 3; Semen Iosifovich German, ulitsa Mayakovskogo, 11, kv. 21; Ivan Fedorovich Ochkovsky, ulitsa Kleimenovskaya 15, and Teodor Markovich Zilber, ulitsa Danilevskogo, 22, kv. 100, all of Kharkov, U.S.S.R.

Filed Apr. 10, 1973, Ser. No. 349,813
Int. Cl. F01d *25/32*
U.S. Cl. 415—168 **2 Claims**

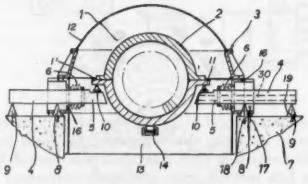


1. A diaphragm for a steam turbine stage comprising hollow guided blades having concave and convex surfaces for directing the main wet steam flow onto turbine rotor blades; a diaphragm rim having one end of each guide blade being fixed thereto; and a diaphragm body having the other end of each said guide blade fixed thereto, each said guide blade having a flat surface portion on the convex surface proximate the wet steam inlet side thereof, a plurality of radially spaced slots in said flat surface portion extending along the upstream side of each said blade and communicating with the interior of said blade, and a radially extending recessed portion forming a groove common to all of said slots on respectively each of said blades for collecting the liquid phase formed on said flat surface portion of each blade.

3,881,843
LOW-PRESSURE STEAM TURBINE CASING

Pierre Meylan, Neuenhof, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 31, 1973, Ser. No. 411,220
Claims priority, application Switzerland, Nov. 28, 1972, 17221/72
Int. Cl. F01d *25/24, 25/26, 25/28*
U.S. Cl. 415—219 R **5 Claims**



1. A foundation supported turbine structure wherein the turbine casing is of the double-shell type comprising an inner casing within which is mounted the rotor and stationary guide blading and an outer casing spaced from said inner casing, central guide means for said inner casing for accommodating thermal expansion thereof, support means for said inner casing comprising cantilever arms carried by the foundation and extending laterally inward therefrom through openings pro-

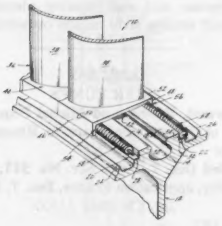
vided in said outer casing to corresponding support points for said inner casing at opposite sides thereof, each said support point for said inner casing on said cantilever arm including a bearing structure mounted for omni-directional sliding movement on said arm in a horizontal plane, and means for supporting said outer casing at least indirectly by said foundation.

3,881,844

BLADE PLATFORM VIBRATION DAMPERS

John D. Hennessey, West Chester, and Richard Beal, Loveland, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 28, 1974, Ser. No. 473,680
Int. Cl. F01d *5/10*
U.S. Cl. 416—145 **13 Claims**



1. In a turbomachinery assembly including a fluid flow path, generally cylindrical support means, a plurality of radially extending blades attached to said support means, each of said blades comprising an airfoil, mounting means for attaching said blade to said support means, and a platform disposed in a spaced relationship with said support means and positioned between the airfoil and the mounting means for partially defining the flow path, vibration damping means comprising:

encasing means disposed between said support means and said blade platform, being in frictional contact with and capable of exerting radial pressure on said blade platforms during operation in the fluid flow path, for damping blade platform movement; and

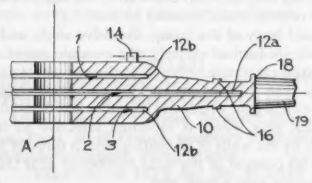
a flexible core element cooperating with and movable with respect to said encasing means, and in frictional contact therewith.

3,881,845

CERAMIC TURBINE WHEEL

Eldon W. Hauck, Worcester, Mass., assignor to Norton Company, Worcester, Mass.

Filed July 2, 1973, Ser. No. 375,347
Int. Cl. F01d *5/28*
U.S. Cl. 416—241 **3 Claims**



1. A turbine wheel comprising a unitary hub-blade assembly formed of reaction bonded silicon nitride so that its radial cross section transversely between opposing surfaces thereof includes a relatively wide cross-sectional area extending substantially more than one-fourth inch between its opposing outside surfaces and including mutually spaced but interconnected individual portions thereof, wherein

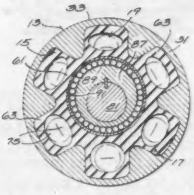
the outside and inside surfaces of said relatively wide cross-sectional area are so shaped and relatively disposed that every part of each individual portion of the relatively wide cross-sectional area has at least one transverse dimension extending between the opposing surfaces thereof which is no greater than one-fourth inch.

3,881,846

FLUID PUMP WITH RESILIENT PUMPING MEMBRANE

Gerald E. Kashmerick, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 6, 1973, Ser. No. 385,853
Int. Cl. F04b *43/08, 45/06*
U.S. Cl. 417—478 **4 Claims**



1. A fluid pump comprising a hollow housing including means defining a series of radially inwardly open, elongated pockets arranged in a circular array with the axis of said array being generally parallel with the elongation of said pockets, a pumping membrane of resilient material including a series of elongated pumping cavities respectively located in said housing pockets, a series of one-way inlet valves respectively connected with said pumping cavities, a series of one-way outlet valves respectively connected with said pumping cavities, rotary means located within said housing in excentric relation to said array of pockets for periodically squeezing said membrane within said pockets to reduce the volume of said cavities and thereafter permitting resilient expansion of said cavities within said pockets so as thereby to induce fluid outflow from said cavities through said outlet valves in response to squeezing of said membrane and to induce fluid inflow into said cavities through said inlet valves in response to said resilient expansion of said cavities.

3,881,847

ROTARY EXPANSION ENGINE OF THE TYPE HAVING PLANETATING ROTOR

Hsin S. Chen, Hasbrouck Heights, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Nov. 30, 1973, Ser. No. 420,445
Int. Cl. F01c *1/02;* **F04c** *17/02*
U.S. Cl. 418—61 A **8 Claims**

1. A rotary expansion engine comprising:

a. a housing having opposite end walls spaced apart by a trochoidal peripheral wall and defining therebetween a multi-lobe trochoidal shaped cavity;

b. said lobes meeting each other at lobe junctures;

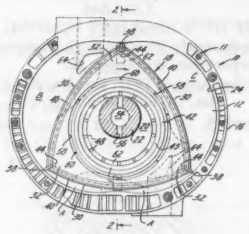
c. a rotor having opposite side wall surfaces interconnected by a plurality of peripheral flank surfaces;

d. the rotor supported for eccentric rotation within said cavity and disposed therein with one of each of the side wall surfaces lying adjacent an end wall of the housing;

e. seal means disposed in the interstices between each of the end walls and adjacent side wall surfaces of the rotor;

f. the rotor and housing defining therebetween a plurality of working chambers which successively expand and contract as the rotor eccentrically rotates within the housing cavity;

g. a first passageway means in said rotor communicating with a source of pressurized fluid to receive the latter;
h. port means in said rotor communicating with said first passageway means and the interstices between the end wall of the housing and the adjacent side wall surface of the rotor;
i. second passageway means in at least one of the end wall surfaces located adjacent each of the lobe junctures for



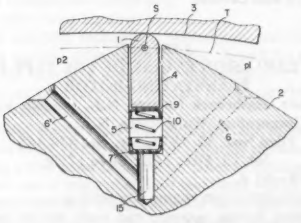
bypassing pressurized fluid around said seal means and located and sized so as to intermittently communicate the port means with a fluid tight working chamber as the rotor rotates thereby delivering pressurized fluid to such working chamber for effecting expansion of the pressurized fluid and rotation of the rotor; and
j. exhaust means communicating with the working chambers for passing spent pressurized fluid from the working chambers following expansion of the pressurized fluid.

3,881,848

PACKING STRIP ARRANGEMENT FOR HIGHLY SUPERHEATED GASES IN ENGINES AND OTHER WORKING MACHINES

Franz Huf, Constance, Germany, assignor to Dornier System GmbH

Continuation of Ser. No. 274,726, July 24, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,235
Claims priority, application Germany, Aug. 4, 1971, 2138988
Int. Cl. F01c *19/02;* **F04c** *27/00*
U.S. Cl. 418—123 **6 Claims**



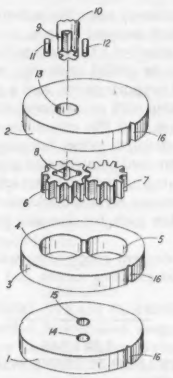
1. In a sealing strip arrangement for a rotary piston engine of trochoidal construction with an inner or outer envelope curve and having a plurality of working chambers, radial grooves in the periphery of that one of the housing and piston of said engine which corresponds to said envelope curve, sealing strip means mounted in said grooves, smaller in radial dimension than said grooves to form a groove space beneath said sealing strip means and having arch-shaped domes on the edge thereof facing the other of said housing and piston, and a pair of bores connecting said groove space with first and second working chambers, respectively, of said engine, the improvement comprising, said domes having their center of curvature positioned on the exact point of intersection of the trochoid and said envelope curve, said sealing strip means having both sides thereof in sufficiently tight contact with the corresponding side walls of said grooves to prevent said sealing strip means from moving transversely in said grooves throughout operation of said engine and thereby maintain said center of curvature of said domes on said point of intersection at all times and maintain an essentially gas tight relation between both sides of said sealing strip means and said side walls of said grooves, a pair of second bores radially extending from said grooves and each connecting said groove space with a respective one of the first-mentioned bores, sealing element means mounted in said grooves at the base of said sealing strip means and resting against said side walls of said grooves, sealing cuff means mounted in said groove space and adapted to close off said second bores and spring means mounted in said groove space between said sealing element means and said sealing cuff means to simultaneously act against said sealing cuff means and said sealing element means and thereby urge said sealing strip means outwardly.

3,881,849

GEAR PUMPS

Roger Commarmot, Rhone, and Michel Pequignot, Hauts de Seine, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Dec. 7, 1972, Ser. No. 311,716
Claims priority, application France, Dec. 7, 1971, 71.43880
Int. Cl. F04c *15/00*
U.S. Cl. 418—182 **2 Claims**

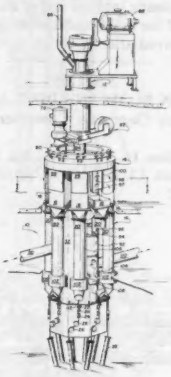


1. In a gear pump comprising two intermeshing cylindrical gear wheels located in two part cylindrical communicating seats of the body of the pump provided with inlet and outlet orifices for the fluid, and with an orifice for the passage of the drive shaft for driving the driven gear wheel, each of said orifices being located in an end wall of the body of the pump, the improvement which consists in that:
a. the said body of the pump, the drive shaft, and the gear wheels are formed entirely of a ceramic material;
b. the axial clearance between each gear wheel and its seat is less than 20 microns and the diametral clearance between each gear wheel and its seat is less than 50 microns;
c. each gear wheel is mounted effective to be guided solely by the walls of its seating, which directly enclose at least 80 percent of the total number of gear teeth of the respective gear wheel; and
d. the drive shaft engages freely and with play in a non-circular cross-section recess in an end face of the driven gear wheel and passes through the body of the pump through an orifice, the diametral clearance between the drive shaft, and the orifice being between 2 and 10 microns.

3,881,850
MELT SPINNING TOWER MODULE AND CIRCULAR MELT SPIN BLOCK THEREFOR

Bruce W. Stockbridge, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,121
Int. Cl. D01d *5/08*
U.S. Cl. 425—72 **7 Claims**



1. A melt spinning tower module for melt spinning of polymers into textile filaments, the tower module comprising:

an upstanding central core;

a circular spin block positioned at the top of the central core, and having inlet means for receiving melted polymer within the spin block from a source of supply and having a plurality of spin packs through which the melted polymer is spun from the spin block into a plurality of hot, plastic filaments; and

a plurality of quench cabinet-take-up assemblies connected to, extending around and down the outside of the central core for receiving from respective spinning packs in each assembly the hot, plastic filaments;

each quench cabinet-take-up assembly including a vertically extending quench cabinet within which the hot, plastic filaments are quenched; a vertically extending quench stack below and following the quench cabinet for continued quenching and curing the hot, plastic filaments into textile filaments; and means below the quench stack for processing the textile filaments as they emerge from the quench stack;

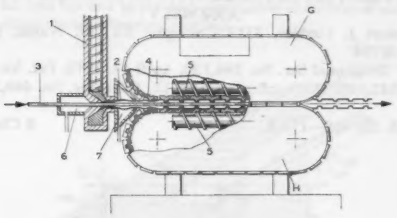
said upstanding central core being cylindrical and hollow, and its cylindrical wall forming a back wall for each of the respective quench cabinets; each said back wall defining therethrough an opening; and means for introducing through each of the openings into the quench cabinets a quenching medium directed against the hot, plastic filaments being spun into the quench cabinets.

3,881,851
MACHINES FOR FORMING INSULATION FOR HIGH FREQUENCY TRANSMITTING COAXIAL LINES

Jacques Allanic, Sceaux; Philippe Beraudy, Riom, and Louis Guillon, Paris, all of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Nov. 5, 1973, Ser. No. 413,023
Claims priority, application France, Dec. 13, 1972, 72.44276
Int. Cl. B29d *23/00*
U.S. Cl. 425—113 **8 Claims**

1. In a machine for forming the between-conductor insulation of a coaxial conductor pair for the transmission of high frequency electric signals, means for extruding around said inner conductor a thin tube of thermoplastic material and for constricting said tube at periodically spaced points along said inner conductor, said means including a succession of substantially identical small dies forming at least one endless chain driven at a constant linear speed by endless screws, part of said dies being pressed against said tube up to contact thereof with said inner conductor, the improvement consisting in that the successive dies in each chain freely contact each other and

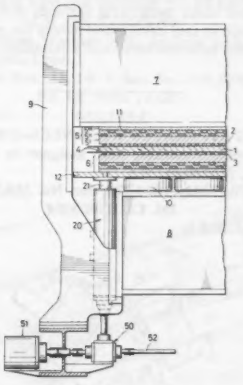


are mechanically independent of each other and move in endless slides, and in that said machine includes in each chain an exchange mechanism for replacing at random time intervals a small number of succeeding dies by an equal number of similar dies taken out from a reserve magazine, the exchanging being effected without stopping the operation of the machine and being controlled by electric pulses generated at random times by a random pulse generator.

3,881,852
MEANS FOR MAINTAINING SPACING IN A CONTINUOUS PRESS

Karl-Heinz Ahrweiler, Krefeld, Germany, assignor to Eduard Kusters, Krefeld, Germany

Filed Aug. 27, 1973, Ser. No. 391,585
Claims priority, application Germany, Aug. 29, 1972, 2242399
Int. Cl. B29c *3/06*
U.S. Cl. 425—149 **5 Claims**



1. In a press having two press platens, each of which is supported on an external support construction wherein the force from one press platen is transmitted to its corresponding support construction through a pressure fluid within a pressure element positioned between the platen and its corresponding support construction, apparatus for maintaining constant spacing between the two press platens comprising:

a. means rigidly coupling the support constructions associated with each of said two press platens;

b. means for sensing deviations of one press platen from a predetermined position and for regulating the pressure elements so as to maintain said one press platen at said predetermined position during a pressing operation so as to maintain said predetermined position throughout the pressing operation.

3,881,853

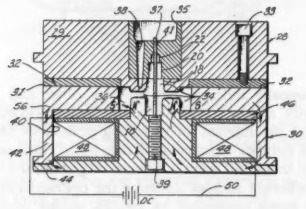
APPARATUS FOR FABRICATING AN INTEGRAL ROTOR ASSEMBLY

Robert J. Loubier, 3111 Covington Rd., Ft. Wayne, Ind. 46704

Division of Ser. No. 244,130, April 14, 1972, Pat. No. 3,842,148. This application Apr. 12, 1974, Ser. No. 460,338

Int. Cl. B29f *1/00*

U.S. Cl. 425—174.8 **8 Claims**



1. Apparatus for molding an integral rotor assembly for a dynamoelectric machine comprising two engageable mold sections which define a mold cavity therebetween, a first part of said cavity being in one of said sections and a second part in the other, said cavity havingh a cylindrically shaped peripheral portion defining inner and outer coaxial peripheral surfaces and an axially extending portion, means for conducting molten thermoplastic material to said cavity, said mold sections having engageable parting surfaces that generally define a plane normal to the axis of said cavity, magnetic means for producing a magnetic field providing unidirectional flux lines radially through the peripheral portion of said cavity between said inner and outer peripheral surfaces during the molten phase of plastic in said cavity, and means for providing a high reluctance path between said axially extending and peripheral portions.

3,881,854

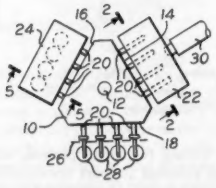
MOLDING APPARATUS WITH NECK-GATED MOLD

Dewey Rainville, Westfield, N.J., assignor to Rainville Company, Inc., Middlesex, N.J.

Filed May 10, 1973, Ser. No. 358,922

Int. Cl. B29f *3/04*

U.S. Cl. 425—242 B **10 Claims**



1. Apparatus for making molded plastic articles including an injection mold having a cavity therein, a core rod, an opening at one end of the cavity through which the core rod extends into the cavity, the core rod having a neck portion fitting firmly around said opening to close the open end of the cavity against escape of plastic from the cavity during injection of a parison around the portion of the core rod that extends into the cavity, the core rod having a free end remote from said neck portion and spaced from the end of the cavity that is remote from said opening through which the core rod extends into the cavity, a passage in the mold opening at one end through a side of the mold and leading to the cavity at a location adjacent to the end of the cavity through which the neck portion of the core rod extends into said cavity, an extruder for forcing plastic into the end of the passage that opens through the side of the mold, and a blowing mold to which the core rod is transferred after injection of the parison.

3,881,855

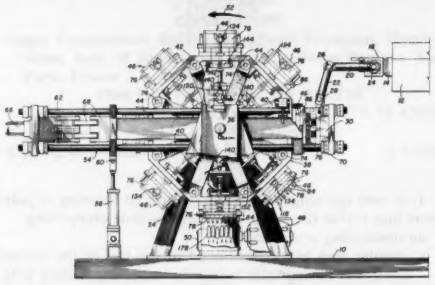
INJECTION BLOW MOLDING APPARATUS

Francis Farkas, c/o Clearplass Container Inc., Phelps, N.Y. 14532

Filed Jan. 16 1973, Ser. No. 324,148

Int. Cl. B29d *23/02, 23/03*

U.S. Cl. 425—342 **15 Claims**



1. An injection molding machine comprising a series of molds, a core for each mold, means constantly traveling said molds in a closed path, a plastic injection device, means to travel the latter in synchronism with each mold successively for a portion only of said path, means to actuate the plastic injection device to cause the same to inject plastic material onto the core of each mold during the period of mutual travel of each mold and the plastic injection device,

a cavity in the plastic injection device, said cavity receiving each core in turn, said cavity forming the plastic on each core in turn, the plastic injection device injection plastic into said cavity,

a pair of cavity forming members on each mold, means to open and close said members about the core on the respective mold, and

means to blow air into the plastic on each core upon closing of the cavity forming members on each mold.

3,881,856

PLANT FOR THE FABRICATION OF PARALLEL MOLDED CONSTRUCTION ELEMENTS

Edouard Maire Fougea, Paris, France, assignor to Constructions Edmond Coignet, Paris, France

Filed Nov. 27, 1972, Ser. No. 309,815

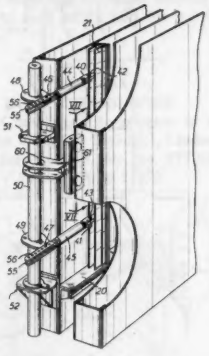
Claims priority, application France, Dec. 6, 1971, 71.43664

Int. Cl. B28b *1/08*

U.S. Cl. 425—432 **11 Claims**

1. A plant for molding construction elements comprising a frame, a plurality of form panels serially connected together, lateral and lower flanges provided on one face of each form panel for defining molding cavities with the other face of adjacent form panels, a stationary end wall fixed to the frame, and a mobile end wall displaceable along the frame for moving said plurality of form panels therewith, means permanently connected to the lateral flanges for displacement parallel to the associated form panel, the means for displacing the lateral flanges comprising a control mechanism including rods con-

nected to the flanges and adjustably connected to pivot arms mounted for rotation on an operating shaft supported on one form panel of each pair forming a molding cavity, and locking means including locking arms rotatably mounted on the oper-

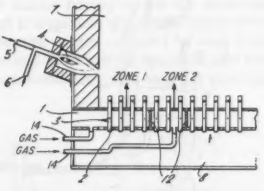


ating shaft and adapted to be held between the adjacent panels of each pair, vibrator devices mounted in fluidtight recesses in the form panels, and damping means arranged between the panels and the frame for reducing the transmission of vibrations from the panels to the frame.

3,881,857
COMBUSTOR

Herbert Raymond Hoy, Leatherhead; Alan Gregson Roberts, Dorking, and Dennis Malcolm Wilkins, Chipstead, all of England, assignors to BP Trading Limited, London, England

Filed Mar. 6, 1974, Ser. No. 448,489
Claims priority, application United Kingdom, Mar. 20, 1973, 13283/73
Int. Cl. F23d *19/02*
U.S. Cl. 431—7 **13 Claims**



1. A distributor plate for igniting a fluidized bed furnace comprising: a chamber having fuel gas inlets; a plurality of air tubes passing through the chamber, the interior of the air tubes being in communication with the chamber by means of holes, one end of the air tubes terminating in heads having outlets; dividing means in the chamber adapted to allow fuel gas to be supplied to a progressively increasing number of air tubes and fuel gas ignition means substantially adjacent to the plate.

3,881,858
RADIANT GAS BURNER

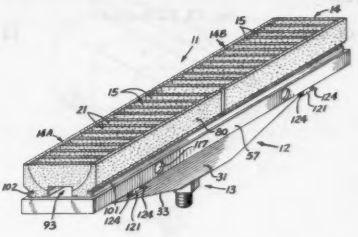
Carl E. Fitzgerald, 8901 Manyo Ave., Morton Grove, Ill. 60053

Filed Apr. 19, 1974, Ser. No. 462,390
Int. Cl. F23d *13/12*
U.S. Cl. 431—348 **13 Claims**

1. A radiant gas burner comprising an elongated upper refractory ceramic body having a series of transversely extending vanes spaced longitudinally from each other and defining therebetween separated combustion chambers,

a manifold body disposed beneath and supporting said refractory body, said manifold body comprising a metal stamping having an elongated manifold chamber and a separate metallic burner vent bar mounted on said metal stamping, means providing a fuel inlet port into said manifold body,

a refractory means covering a portion of said vent bar exposed to said combustion chambers to protect said metallic vent bar and to provide combustion chambers of substantially all refractory material,



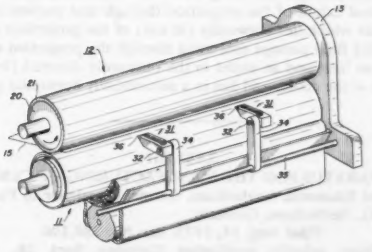
a series of burner vent slots of narrow width spaced longitudinally in said vent bar and aligned with and beneath said transversely extending vanes in said refractory body, said slots being in fluid communication with said manifold chamber to discharge the fuel mixture therefrom directly against said vanes for flowing thereabout and into said combustion chambers,

said vent bar having a cross-sectional thickness greater than said cross-sectional thickness of said metal stamping and being supported in said metal stamping, said vent bar being cast of a scale resistant metal to retard closing of said vent slots with oxidation of said cast metal of said vent bar.

3,881,859
STRIPPER FINGER DESIGN TO PREVENT "OIL-ON-THE-COPY"

Willard C. Hamilton, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1973, Ser. No. 418,538
Int. Cl. B05c *11/00*
U.S. Cl. 432—60 **7 Claims**



5. Mechanism for removing substrate material from a heated roll adapted to fuse toner particles thereto wherein the surface of the heated roll is provided with material for preventing adherence of the toner particles thereof, said mechanism comprising:

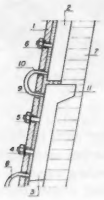
at least one pickoff finger pivotally supported relative to said heated roll such that a leading edge thereof contacts the surface of the heated roll; and

means associated with said at least one pickoff finger for absorbing excessive amounts of adherence-preventing material and conveying said excessive amounts away from said leading edge.

3,881,860
COOLED SHAFT-FURNACE AND STAVE-COOLER TO BE USED THEREFOR

Jan Hendrik Brandenburg, Julianaplein, Netherlands

Filed Dec. 18, 1973, Ser. No. 425,853
Claims priority, application Netherlands, Dec. 19, 1972, 7217255
Int. Cl. F27b *1/24*
U.S. Cl. 432—83 **12 Claims**



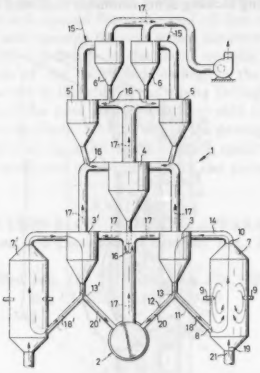
1. Stave-cooler for a lined shaft furnace, suited for being provided as one of a series of aligned members in horizonal rows to be cooled, the members of the horizontal rows being aligned to provide vertical rows, vertical pipes for passing a coolant accommodated by each member and with external pipes connecting the pipes of the cooling members of one horizontal row with the vertical pipes of the cooling members vertically aligned therewith in the horizontal row thereabove, having a projection on its face which is inwardly directed in use for supporting the furnace lining, a plurality of passages for cooling fluid extending through the cooler in directions having at least a vertical (in use) component, at least some of the said passages extending for at least a substantial part of the vertical extent of the projection through that portion of the cooler which lies outwardly (in use) of the projection and a further fluid passage extending through the projection which has an inlet and an outlet in the outwardly directed (in use) face of the cooler and lies in a substantially horizontal plane.

3,881,861
APPARATUS FOR THE MANUFACTURING OF CEMENT

Horst Ritzmann, Neubeckum, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Aug. 14, 1973, Ser. No. 388,196
Claims priority, application Germany, Sept. 26, 1972, 2247172
Int. Cl. F27b *7/02*
U.S. Cl. 432—106 **7 Claims**

1. Apparatus for the manufacture of cement, lime, alumina and the like from raw material, said apparatus comprising preheater means; means for delivering raw material to said preheater means; a furnace; means for discharging raw material from said preheater means to said furnace; means establishing a heated idling zone; means for diverting from said furnace to said idling zone a portion of raw material discharged from said preheater means; and means connecting

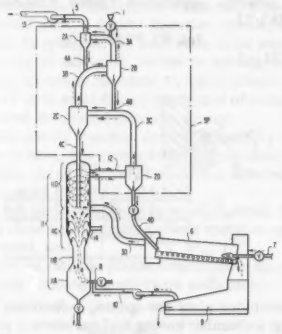


said idling zone to said preheater means for returning to the latter raw material diverted to said idling zone.

3,881,862
APPARATUS FOR CALCINATION OF CEMENT-CLINKER

Toyomi Nishida; Hiroshi Sohma, and Hayami Ito, all of Hyogo, Japan, assignors to Kawasaki Jukogyo K.K., Hyogo, Japan

Filed Sept. 4, 1973, Ser. No. 394,017
Claims priority, application Japan, Sept. 4, 1972, 47-88536
Int. Cl. F27b *15/00*
U.S. Cl. 432—106 **3 Claims**



1. An apparatus for calcination of cement clinkers comprising a substantially cylindrical vertically disposed calcining furnace having in series from bottom to top a combustion chamber portion providing with burner means, a reduced diameter throat portion, a spouted bed portion provided with additional burner means and an uppermost heat exchange chamber portion; a suspension type raw material preheating means having inlet means for receiving raw material and outlet duct means extending into said furnace for supplying preheated material to the upper portion of said spouted bed portion; a rotary kiln means having burner means at one end and exhaust gas outlet means at the opposite end thereof, duct means connecting the exhaust gas outlet means to the upper portion of said spouted bed portion of said furnace, said duct means extending into said cylindrical furnace substantially tangentially thereto, outlet duct means disposed substantially tangentially with respect to said cylindrical furnace at the top

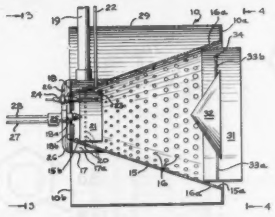
of said uppermost heat exchange chamber for removing heated gases and calcined material from said furnace, cyclone separator means having an inlet connected to said outlet duct means, a first outlet connected to said suspension type preheating means for supplying hot gases thereto and a second outlet connected to said rotary kiln for supplying calcined material thereto.

3,881,863

DUAL FUEL BURNER

Walter R. Creuz, Chatham, N.J., assignor to Aero-Flow Dynamics, Inc. (The Wing Co. Division), Linden, N.J.

Filed July 9, 1973, Ser. No. 377,538
Int. Cl. F23d *11/02*
U.S. Cl. 432—222 **22 Claims**



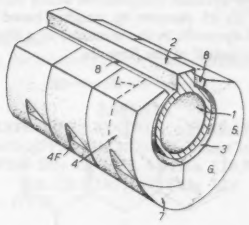
1. A dual fuel airstream type burner having a high turndown ratio characteristic when burning gas or oil, comprising an elongated conical burner cone having a plurality of longitudinally spaced apart, circumferential rows of air apertures disposed along substantially its length, said apertures being smaller in diameter in said rows thereof towards the small end of said burner cone and being larger in diameter in said rows thereof towards the large end of said burner cone whereby the sequential rows of said apertures introduce increasing amounts of combustion air in the correct proportions for progressively increasing firing rates of the burner, an oil fuel nozzle mounted centrally of the small end of said burner cone, said oil fuel nozzle having means for atomizing fuel oil fed therethrough to a particle size smaller than about **25** microns, gas port aperture means adjacent to said small end of said burner cone, and gas manifold means on said small end of said cone and communicating with said gas port aperture means.

3,881,864

SHEATHING FOR METAL FURNACE MEMBERS

Peter John Nicol, Eastham, England, assignor to Morgan Refractories Limited, Neston, Wirral, Cheshire, England

Filed Apr. 29, 1974, Ser. No. 465,342
Claims priority, application United Kingdom, May 3, 1973, 21104/73
Int. Cl. F27b *9/14*
U.S. Cl. 432—234 **23 Claims**



1. A refractory tile for sheathing a horizontal metal furnace member and consisting of a substantially C-shaped block with a hollow side to embrace one lateral side portion of a furnace member of appropriate size, an upper end to engage over the furnace member and a lower end designed to swing, under gravity, beneath the furnace member so as to extend more than half-way thereunder in engagement with a complementary tile, characterised thereby that the lower end of the block includes means for interengaging with a complementary tile to form a collar around the furnace member and oppose axial separation of the tile from its complementary tile, said means comprising a circumferentially projecting terminal portion with a reduced cross-sectional dimension and with circumferential surfaces facing respectively with a component in both axial directions and so constructed, arranged and oriented that when said terminal portion of the tile is interengaged with a complementary tile to form a collar around the furnace member, said circumferential surfaces provide abutments to oppose axial separation of the tile from its complementary tile.

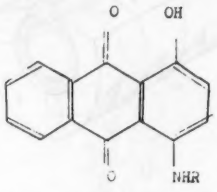
3,881,865
ANTHRAQUINONE DYESTUFF MIXTURES

Colin William Greenhalgh, and David Francis Newton, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

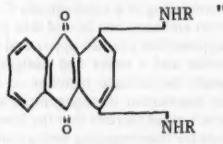
Filed Apr. 26, 1973, Ser. No. 354,913
Claims priority, application United Kingdom, June 2, 1972, 25859/72
Int. Cl. C09b ; D06p *1/00, 3/00, 5/00, 7/00*
U.S. Cl. 8—25 **2 Claims**

1. A disperse dyestuff composition which comprises

a. from 65 to 95 percent by weight (based on the total weight of dyestuffs in the mixture) of a disperse anthraquinone dyestuff of the formula

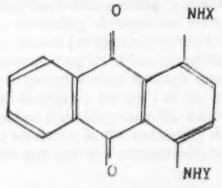


which can contain up to 30 percent of its own weight of a disperse anthraquinone dyestuff of the formula



wherein R represents a phenyl radical which can be substituted by one or more chlorine or bromine atoms or by hydroxy, amino, lower alkyl, lower alkoxy, hydroxyloweralkoxy, N-lower alkylamino, N:N-di(lower alkyl) amino, carbo lower alkoxy, lower alkoxycarbonyloxy or lower alkylcarbonyloxy groups;

b. from 5 to 35 percent by weight (based on the total weight of dyestuffs present in the mixture) of one or more disperse anthraquinone dyestuffs of the formula:



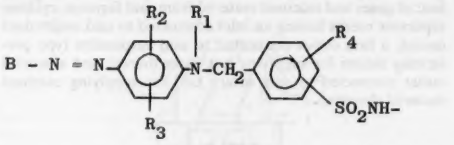
wherein X and Y each independently represent a lower alkyl, hydroxy lower alkyl or lower alkoxy lower alkyl radical.

3,881,866
POLYESTER OR POLYACRYLONITRILE FIBERS DYED BY QUATERNIZED OR UNQUARTERNIZED AZOANILINO-TOLUENE SULFONAMIDOALKYLENEAMINE

Edgar E. Renfrew, Lock Haven, Pa., assignor to American Aniline Products, Inc., Paterson, N.J.

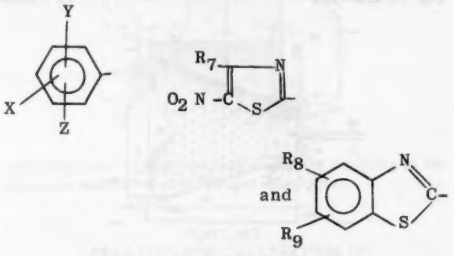
Filed Nov. 3, 1972, Ser. No. 303,429
Int. Cl. D06p *3/54, 3/76*
U.S. Cl. 8—41 A **14 Claims**

1. A polyester textile material dyed with a compound of the formula:



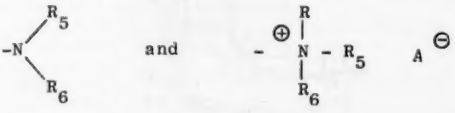
in which:

B is a member selected from the group consisting of



wherein

X, Y, and Z are	members selected from the group consisting of hydrogen, nitro, chlorine, bromine, lower alkoxy, lower alkyl, cyano, sulfamyl, N-(lower alkyl)-sulfamyl, N,N-(dilower alkyl)-sulfamyl, lower acrylamido, trifluoromethyl, lower alkyl sulfonyl, carbamyl, N-(lower alkyl)carbamyl and N,N-(dilower alkyl) carbamyl; hydrogen or methyl; and
R_7 is	hydrogen or methyl; and
R_8 and R_9 are	members selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine, bromine, nitro, sulfamyl, N,N-(dilower alkyl) sulfamyl, cyano, and lower alkyl sulfonyl;
R_1 is	lower alkyl, cyano lower alkyl, and hydroxy lower alkyl;
R_4, R_5 and R_6 are	hydrogen, lower alkyl, lower alkoxy, chlorine and bromine;
n is	an integer having a value of 2-4;
Q is	a member selected from the group consisting of



R_5 and R_6 are	methyl or ethyl;
R is	hydrogen, methyl, or ethyl; and
$A^{\ominus}$ is	a water soluble anion.

3,881,867
DISPERSE DYEING WITH POLYMERIC FATTY NITRILE SOLUTION

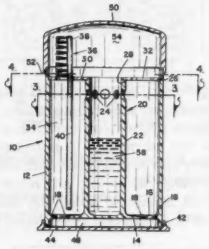
Gerardus Johannes van Veersen, Goude, Netherlands, assignor to Emery Industries, Inc., Cincinnati, Ohio

Filed Jan. 29, 1973, Ser. No. 327,287
Claims priority, application United Kingdom, Jan. 28, 1972, 4179/72
Int. Cl. D06p *5/04*
U.S. Cl. 8—169 **2 Claims**

1. A method for dyeing polypropylene or polyester materials in the form of sheets, foils, monofilaments, or fibers comprising treating said materials containing an effective amount

of a polymerized fatty acid nitriles containing 20-75 carbon atoms and having 2-4 nitrile groups with an aqueous medium containing a dyestuff.

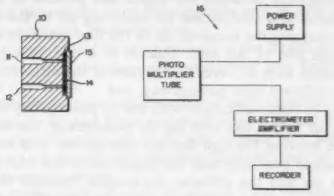
3,881,868
TOOTHBRUSH HOLDER AND STERILIZER
Edna Mae Duke, P.O. Box 3431, South Gate, Calif. 91744
Filed Mar. 6, 1974, Ser. No. 433,388
Int. Cl. A61l *3/00*
U.S. Cl. 21—83 **4 Claims**



1. A toothbrush holder and sterilizing device comprising:
a wall defining a holder body; a bottom wall fixedly attached to said holder body wall at the lower end of said body, said bottom wall having a plurality of perforations therethrough;
a substantially imperforate tubular reservoir means for holding sterilizing liquid extending upwardly from the bottom wall and closed at the lower end by said bottom wall, the upper end of said reservoir being open, the reservoir being defined by a tubular wall of smaller cross-sectional area than the interior cross-sectional area of the body, the space between the wall of the body and the wall of the reservoir defining a sterilizing chamber therebetween;
an annular disk having a plurality of spaced apart toothbrush handle receiving openings through said annular disk, said disk having a central opening therethrough for accommodating the upper end of said tubular reservoir, said holder body having means for supporting said disk adjacent the upper end of the body, the perforations in said bottom wall acting to drain any liquid which would otherwise accumulate within said chamber; a drainage cup mounted at the lower end of said holder body below said perforations in said bottom wall for collecting liquid draining through said perforations; and
a removable cap for the upper end of the body.

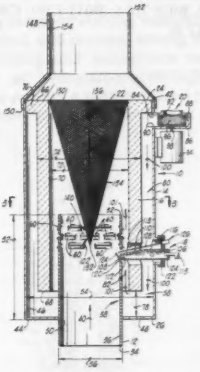
3,881,869
CHEMILUMINESCENT DETECTION OF OZONE
Radhakrishna Murty Neti, Brea, and George I. Reeves, Fullerton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed July 2, 1973, Ser. No. 375,481
Int. Cl. G01n *31/10*
U.S. Cl. 23—232 E **7 Claims**

1. A method of quantitatively measuring the concentration of ozone in a gas sample, which method comprises:
contacting a bed of solid particles of an organic polymer having a backbone chain consisting of carbon atoms with an ozone containing gas sample to produce chemiluminescence, and



measuring the intensity of the chemiluminescent light.

3,881,870
EFFLUENT CONTROL APPARATUS
Lonnie P. Hatfield, P.O. Box 237, Oklahoma City, Okla. 73101
Filed July 13, 1973, Ser. No. 378,983
Int. Cl. F23c *9/04*; **F23g** *7/06*
U.S. Cl. 23—277 C **9 Claims**



1. An effluent control apparatus for receiving an effluent contaminated with a pollutant, comprising:
an inlet conduit, having an upper end, a lower end, and an effluent inlet passageway formed therethrough;
a baffle having baffle openings and a portion disposed near the upper end of the inlet conduit;
means engaging the baffle and supporting the baffle, a portion of the baffle being supported generally near the upper end portion of the inlet conduit;
a burner assembly, having a portion disposed near a portion of the effluent inlet passageway and near a portion of the baffle discharging a flame in an operating position of the burner assembly, the flame heating a portion of the effluent inlet passageway and a portion of the baffle to a predetermined temperature level, and the contaminated effluent moving through the effluent inlet passageway in a direction generally from the lower end toward the upper end of the inlet conduit and being discharged through the baffle openings in an operating position of the effluent control apparatus;
an outer casing, having an upper end, a lower end and an opening extending therethrough, a portion of the inlet conduit near the upper end thereof being disposed within a portion of the outer casing opening near the lower end of the outer casing, the lower end portion of the inlet conduit being connected to the outer casing and the upper end of the inlet conduit being spaced a distance below the upper end of the outer casing;

means having a portion disposed between the upper end portion of the inlet conduit and the outer casing and spaced a distance from the inlet conduit forming an air passageway between the upper end portion of the inlet conduit and said means for receiving air or the like and discharging the received air or the like generally near the upper end of the inlet conduit in a direction generally parallel with the direction of flow of the effluent through the effluent inlet passageway; and

means in communication with the air passageway discharging air or the like into the air passageway, the air or the like moving through the air passageway and being discharged generally near the upper end of the inlet conduit, the air and the effluent discharging through the baffle openings in an operational position of the effluent control apparatus.

3,881,871

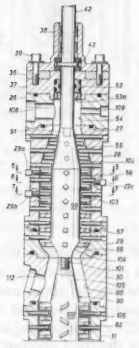
MIXER FOR CONTINUOUS MIXING OF FOAM MATERIALS

Lawrence C. Porter, Palos Verdes Peninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 85,580, Oct. 30, 1970, abandoned. This application Mar. 27, 1973, Ser. No. 345,253

Int. Cl. B02f *7/04*; B01j *1/00*; C08g *22/44*

U.S. Cl. 23—252 R **18 Claims**



17. Apparatus for continuous manufacture of polyurethane by mixing of components comprising

elongated mixer means having a continuous flow passage and lower discharge nozzle,

said mixer means being comprised of upper and lower sections, the major portion of said flow passage in said upper and lower sections having substantially uniform cross-section,

means coupling said upper and lower sections to one another and having a flow path therethrough of a reduced cross-section relative to that of said flow path in said upper and lower sections,

transverse agitating means along the major portions of said flow passage for transversely shearing liquid passing therethrough, and

inlet means for supplying liquid reaction components to said flow passages at at least two locations in the upper section of said mixer means and at at least one location in the lower section of said mixer means.

3,881,872

AUTOMATIC ANALYZING DEVICE

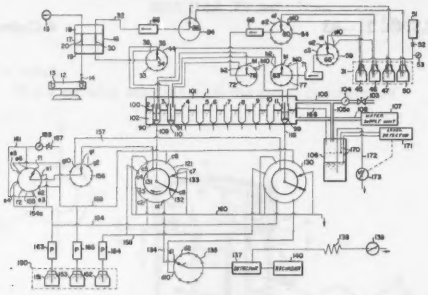
Toyohiko Naono, Akishima, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 387,965

Claims priority, application Japan, Aug. 15, 1972, 47-81708; Aug. 15, 1972, 47-81715; Aug. 15, 1972, 47-81721

Int. Cl. G01n *1/14*

U.S. Cl. 23—253 R **6 Claims**



1. An apparatus for automatically analyzing a plurality of liquid samples comprising:

a. a turntable in which sample container tubes are accomodated and means for intermittently rotating the turntable;

b. a reaction bath composed of a lower chamber associated with means to maintain it at a constant temperature and an upper chamber associated with means to pressurize it with inert gas;

c. a plurality of reaction tubes installed in the said reaction bath vertically positioned in both the upper and lower chambers and opening into said upper chamber;

d. means for drawing samples to be analyzed from said sample tubes rotated thereunder by the turntable;

e. means for delivering the sample to said reaction tubes;

f. means for supplying reagents to said reaction tubes by pressurizing the said reagents with inert gas;

g. means for delivering the contents of the reaction tube through an opening in the bottom of the reaction tube to an analytical instrument for detecting; and,

h. means for cleaning the reaction tubes and said analytical instrument and the instrument delivering means with at least one kind of cleaning solution, such that all the flow lines comprising the drawing means, reagent supply means, sample delivery means, and cleaning means, are isolated from the atmosphere and pressurized with inert gas at a constant pressure to prevent the oxidation of solutions, formation of air bubbles, or the rise of noxious fumes.

3,881,873

MOISTURE INDICATING PROBE AND METHOD OF USE

Iris B. Klowden, 1146 Center Ct., Homewood, Ill. 60430

Filed Apr. 29, 1974, Ser. No. 465,106

Int. Cl. G01n *33/18*, *21/06*

U.S. Cl. 23—253 TP **7 Claims**

1. A moisture indicating single-element device adapted for forced insertion directly into the soil of a potted plant and moisture-sensitive to undergo a visible color change in response to moisture present in said soil, thereby to provide an indication of the moisture condition of the soil,

said device comprising, in combination,

an elongated, longitudinally-rigid probe of wood and similar compositions including fiber board and other cellular-structured materials,

said probe being further characterized by mechanical strength sufficient to permit forced manual insertion of said probe downwardly into the soil of a potted plant and the like to a region near the roots thereof,

a chemical agent deposited on and carried by said probe in a perimetric base zone thereof for direct contact with the soil of a potted plant,

said agent being adhered to said probe so as to resist premature physical dislodgment of said agent from said probe when the probe is thrust into the soil,

said chemical agent being sensitive to moisture to undergo color change, and characterized in assuming one color when dry and a different color when moistened,

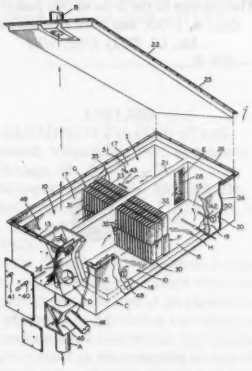
whereby, upon insertion of said probe and said agent carried thereby into and withdrawl of said probe and probe-carried agent from the soil of a potted plant, there is provided a visual indication to denote, for either existing condition, the presence of and the need for added water.

3,881,874

THERMAL INCINERATION AIR POLLUTION CONTROL DEVICE

Howard Edward Shular, North Olmsted, and John Sellors, Jr., Shaker Heights, both of Ohio, assignors to Pyronics, Inc., Cleveland, Ohio

Filed May 7, 1973, Ser. No. 358,146
Int. Cl. B01j 9/02
U.S. Cl. 23—277 C **3 Claims**



1. A thermal incineration air pollution control device for heating a mixture of air and gaseous hydrocarbons to the auto-ignition temperatures of the hydrocarbons comprising:

a. a housing

b. a member having an opening at one end dividing the length of said housing into an elongated U-shaped passageway having a base and leg portions extending therefrom, said passageway adapted to be communicated at both ends with an inlet and a discharge duct through which said gases flow;

c. first valve means in said housing directing said gases from said inlet duct alternately into either end of said passageway and alternately from the opposite end of said passageway into said discharge duct;

d. a heat source in said opening midway of the length of said passageway and dividing said passageway into first and second chambers;

e. heat absorbing means at the ends of each chamber and substantially spaced from said heat source to provide a combustion chamber on each side of said heat source between said heat source and the adjacent ends of said heat-absorbing means;

f. means for periodically actuating said valve means and reversing the direction of flow of gases from said ducts to said passageway whereby gases moving toward said heat source are preheated from heat from said heat-absorbing means and gases flowing from said heat source heat the other heat-absorbing means to an elevated temperature;

g. said actuating means comprising at least one temperature sensing probe in each said passageway and drive means to actuate said valve means when said temperature probe reaches a predetermined temperature whereby the direction of flow of gases through said passageway is reversed and

h. pressure sensing means in working relationship with said temperature probes, said pressure sensing means including means overriding said temperature sensing means when the flow of hydrocarbons through said heat-absorbing means reaches a predetermined pressure drop thereby temporarily preventing reversal of flow through said passageway.

3,881,875

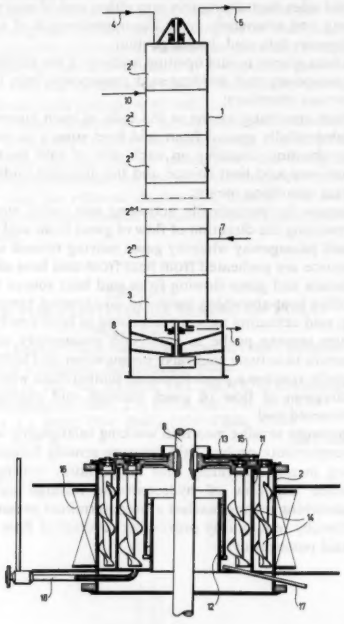
EQUIPMENT FOR THE CONTINUOUS PRODUCTION OF SYNTHETIC RESINS FOR THE VARNISH INDUSTRY

Lajos Brieger, Tiszaszederkeny; Karoly Doktor, Leninvaros; Geza Szekely, Budapest; Tibor Szenas, Miskolc; Gabriella Bekefi, Budapest, and Dezso Zoranyi, Miskolc, all of Hungary, assignors to Tiszai Vegyi Kombinat, Leninvaros, Hungary

Filed Aug. 27, 1973, Ser. No. 391,876
Int. Cl. C08f 1/98
U.S. Cl. 23—283 **4 Claims**

1. Equipment for the continuous production of synthetic resins, comprising an upright fixed cylindrical reactor having a plurality of superposed trays therein, means for heating said trays, a central vertical shaft extending through said trays within said reactor, means for rotating said shaft, mixing elements on said shaft for stirring the material on said trays, each tray having an upstanding cylindrical dividing element thereon, an outer wall radially outwardly of said dividing element and extending from each said tray to a height greater than the height of said dividing element, and radially inwardly of said dividing element an upstanding overflow element of a height less than said dividing element, a spray disc over the mixing element of each tray for directing material to the radially outer side of said dividing element and to the radially inner side of said outer wall so that material flows from the outer side of said dividing element over said dividing element to the inner side of said dividing element and then over said overflow element to the tray below, means for introducing reaction material into the top of the reactor, means for remov-

ing synthetic resins from the bottom of the reactor, means for introducing gas into the reactor below at least some of the



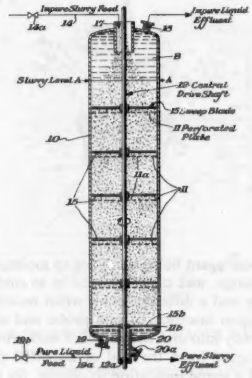
trays of the reactor, and means for removing gas from the top of the reactor.

3,881,876
APPARATUS FOR SINK-FLOAT LIQUID CONTACTING OF SOLIDS

Harold Felton Porter, Hockessin; Foster Wilson Rennie, Wilmington, both of Del., and Addison Heaton Williamson, Beaumont, Tex., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 197,445, Nov. 10, 1971, Pat. No. 3,801,370. This application Nov. 21, 1973, Ser. No. 417,808
Int. Cl. B01d *11/02*
U.S. Cl. 23—270 R **1 Claim**

1. Apparatus for contacting two distinct miscible liquid inputs with solids using the sink-float technique comprising, in combination, a substantially vertical contacting column provided with a plurality of superposed transverse plates each having a multiplicity of apertures in the size range of about ¼ to 1⅛ inches distributed substantially uniformly across the entire areas of said plates, the free area of said plates being approximately 5 to 25% and the minimum aperture dimension being in the range of about 5 to 200 times the average particle screen size of said solids, first inlet means for introduction of solids mixed with a first of said liquids disposed at a first preselected level in said column effecting sink-float transit of said solids lengthwise of said column and through said apertures of said plates, powerdriven slow-speed rotary sweep arms disposed at a clearance of about 0.25 to 1.5 inches with respect to the solids inlet sides of said plates, second inlet means for introduction of the second of said liquids disposed at a second preselected level spaced lengthwise of said column from said first preselected level in the direction of said sink-float transit of said solids, a first exit means for drawing off said solids mixed with liquids constituting the bulk of said second liquid together with a relatively minor portion of said first liquid as a first discharge stream from the solids sink-float progression end of said column and a second exit means for simultaneously drawing off the bulk of said first liquid to-

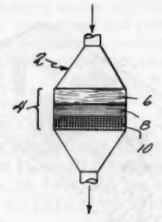


gether with the remainder of said second liquid as a second discharge stream from the end of said column opposite lengthwise from said solids sink-float progression end.

3,881,877
CATALYST SUPPORTING SCREEN

James B. Hunter, Newton Square, Pa., assignor to Matthey Bishop, Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 186,630, Oct. 5, 1971, Pat. No. 3,776,701. This application Aug. 23, 1973, Ser. No. 383,103. The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.
Int. Cl. B01j *1/00, 9/04*
U.S. Cl. 23—288 R **6 Claims**



1. A catalyst supporting structure comprising a pad of heat-resistant wire elements wherein the wire elements are composed of knitted wire, said elements being placed in lateral contacting relationship with each other to provide a pad of substantially uniform thickness and having flat top and bottom surfaces and a woven sheet of heat-resistant material, in addition to said heat-resistant wire elements, positioned directly on the top and bottom surfaces of said pad, said wire being composed of an alloy consisting essentially of aluminum, chromium and iron.

3,881,878

LARGE-SIZED AND LARGE THICKNESS COMPOSITE SLEEVES

Kenzi Maruta, 11-51, Nakahata-cho, Wakamatsu-ku; Atsushi Yamada, 13-2, Kamiharamachi, Wakamatsu-ku, both of Kitakyushi-shi, and Tsunemi Tsuji, 200-1-2, Hirowatari, Ongamachi, Onga-gun, Fukuoka, all of Japan, assignors to Hitachi Metals, Ltd.

Filed Mar. 18, 1974, Ser. No. 452,269

Claims priority, application Japan, Mar. 30, 1973, 48-35681

Int. Cl. B32b *15/02, 15/18*

U.S. Cl. 29—191 **9 Claims**

1. A large-size and large thickness composite sleeve produced by centrifugal casting and having a diameter of over 900 millimeters, said composite sleeve comprising an outer layer of high carbon cast alloy steel having a carbon content of about 1.6 to 2.2 percent by weight and a Shore hardness of over 55, and an inner layer of high carbon cast steel in which crystallization of graphite has taken place, said inner layer having a Shore hardness of about 35 to 42, the ratio of the thickness of said outer layer to the thickness of said inner layer being about 0.5 to 2.6.

3,881,879

AL-SI-MG ALLOY

Ogle R. Singleton, Jr., and Bennie R. Ward, Jr., both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 186,632, Oct. 5, 1971, Pat. No. 3,788,824, which is a continuation-in-part of Ser. No. 18,255, March 10, 1970, abandoned. This application Oct. 15, 1973, Ser. No. 406,351

Int. Cl. C22c *21/02, 23/00*

U.S. Cl. 29—193 **7 Claims**

7. A brazing component in the form of an O-ring, strip, disc, wire or the like, adapted for use as an insert between parts to be joined by brazing, said component being composed of an aluminum base alloy consisting essentially of aluminum, about 9–14.5 percent Si, about 0.2–0.8 percent Fe, and about 0.25–0.7 percent Mg by weight in amounts effective to achieve a melting range of about 20° to about 40°F. and a liquidus temperature of about 1065–1085°F.

3,881,880

ALUMINUM COATED STEEL

David W. Gomersall, Valparaiso, Ind., assignor to Inland Steel Company, Chicago, Ill.

Continuation-in-part of Ser. No. 205,569, Dec. 7, 1971, abandoned. This application Feb. 1, 1974, Ser. No. 438,791

Int. Cl. B32b *15/00*

U.S. Cl. 29—196.2 **19 Claims**

1. An aluminum coated low alloy steel article which has good formability and has good subsurface oxidation resistance and tensile properties when heated at an elevated temperature in an oxidizing atmosphere consisting essentially of an aluminum killed low carbon steel base which has titanium added to the said low carbon steel as the essential added alloy element with the titanium being uniformly distributed throughout the steel in an amount which combines with all of the carbon and nitrogen in the steel and providing an excess of between about 0.1 and about 0.3 weight percent of uncombined titanium throughout the steel, and a uniform thin coating of metallic aluminum directly on a surface of said steel base which is free of surface oxides and non-metallic material, said low alloy steel article in the as-coated condition exhibiting good formability and when heated in an oxidizing atmosphere at an elevated temperature of 1,500°F exhibiting good subsurface oxidation resistance and tensile properties.

3,881,881

ALUMINUM COATED STEEL

Yong-wu Kim, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Apr. 3, 1974, Ser. No. 457,439

Int. Cl. B32b *15/00*

U.S. Cl. 29—196.2 **15 Claims**

1. An aluminum coated low alloy steel article having good formability and resistance to oxidation at elevated temperatures consisting essentially of a low alloy low-carbon steel base having incorporated therein as essential alloying elements a quantity of silicon and aluminum with each being present in an amount ranging between about 0.5 percent to about 2.0 percent by weight of said steel and the ratio of aluminum to silicon being between about 0.5 and about 1.5, and said base having on the surface thereof a coating of aluminum.

3,881,882

ALUMINUM COATED STEEL

Ian F. Hughes, Munster, and David William Gomersall, Valparaiso, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Apr. 19, 1973, Ser. No. 352,597

Int. Cl. B32b *15/18, 15/20;* **C23c** *1/08*

U.S. Cl. 29—196.2 **11 Claims**

1. An aluminum coated low alloy mild steel article adapted for service at an elevated temperature comprising, a low-alloy aluminum killed low carbon steel sheet which contains uniformly distributed throughout as an essential combination of alloy elements titanium in an amount up to a maximum of 1% by wt. which combines with all the carbon and nitrogen and leaving uncombined titanium throughout the steel and molybdenum in an amount between about 0.10 percent and 0.70 percent by wt. of said steel, a uniform thin coating of metallic aluminum directly on a surface of said steel sheet which is free of surface oxides and non-metallic impurities, said article in the as coated condition exhibiting good formability at room temperature and high creep resistance and rupture strength at an elevated temperature of 1300°F – 1500°F, and said article after heating in an oxidizing atmosphere at a temperature of 1500°F and said article having aluminum uniformly diffused into the surface of steel sheet with only discrete particle of metallic oxide formed below the surface of said steel as a discontinuous subsurface stratum; whereby said aluminum coated low alloy mild steel article exhibits increased oxidation resistance, high creep resistance and increased rupture strength on heating the said elevated temperature in an oxidizing atmosphere.

3,881,883

CLAD COMPOSITES AND ALUMINOUS METAL COMPOSITIONS FOR CLADDING

Thomas L. Fritzlen, Richmond, Va., assignor to Reynolds Metal Company, Richmond, Va.

Division of Ser. No. 148,868, June 1, 1971, Pat. No. 3,824,083, which is a continuation of Ser. No. 838,013, June 17, 1969, abandoned, which is a continuation of Ser. No. 609,707, Dec. 23, 1966, abandoned, which is a continuation-in-part of Ser. No. 538,085, March 14, 1966, Pat. No. 3,418,090. This application Nov. 16, 1973, Ser. No. 416,694The portion of the term of this patent subsequent to Dec. 24, 1985, has been disclaimed.

Int. Cl. B32b *15/00*

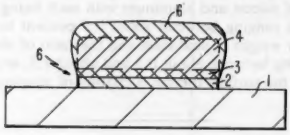
U.S. Cl. 29—197.5 **5 Claims**

1. An article comprising a clad composite having a core of aluminum alloy 7001, and a cladding composed of an alloy consisting essentially of aluminum, about 4–5.5% zinc and about 1–1.6% magnesium, by weight; said core alloy consisting essentially of aluminum, 6.8–8.0% zinc, 2.6–3.4% magnesium, 1.6–2.6% copper and 0.18–0.35% chromium.

3,881,884
METHOD FOR THE FORMATION OF CORROSION RESISTANT ELECTRONIC INTERCONNECTIONS

Herbert Carl Cook, Georgia; Paul Alden Farrar, South Burlington, and Robert Lee Hallen, Essex, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1973, Ser. No. 406,125
Int. Cl. H01l *19/00*
U.S. Cl. 29—590 **10 Claims**

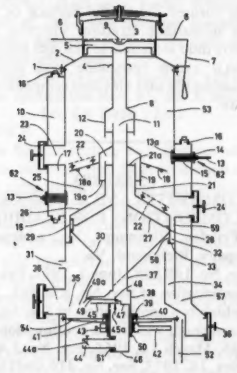


1. In an integrated circuit fabrication process the steps of depositing on a partially fabricated integrated circuit substrate a composite conductive film structure by sequentially forming a first conductive film and superimposing thereon a second conductive film through a transistory layer made of material of both of said first and second films and forming thereon a third noble metal conductive metal film followed by subtractively etching a portion of said composite film to form a given pattern having exposed edges of said second film and heating the etched structure to an elevated temperature in a selected atmosphere to flow by surface diffusion a portion of said noble metal film over the exposed edges of said second film.

3,881,885
GAS GENERATOR

Johann Wagner, Sandstrasse 1/V, 8500 Nurnberg, Germany

Filed Oct. 9, 1973, Ser. No. 404,738
Claims priority, application Germany, Oct. 9, 1972, 2249444
Int. Cl. C10j *3/68*
U.S. Cl. 48—76 **8 Claims**

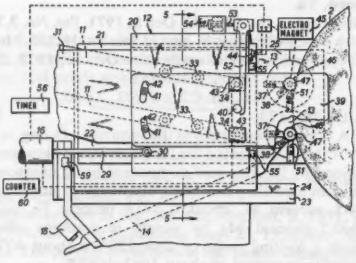


1. A gas generator for both upward and downward gasification, comprising: a housing defining a combustion space, a cinder bath space below the combustion space, and a zone formed by a space in the housing below the cinder bath space, the space below the cinder bath space being arranged in communication with the combustion space; nozzles arranged for feeding air into the combustion space and the cinder bath space; a vertical main pipe in communication with the combustion space, the main pipe having an air inlet and a gas outlet above the air inlet, the gas outlet, when open, opening into the space below the cinder bath space; means for opening and closing the air inlet; means for opening and closing the gas outlet, and means defining a serpentine passageway arranged around the housing and in communication with the space below the cinder bath space; the above gas generator permitting downward and upward gasification, the gas outlet being closed and the air inlet open during downward gasification to allow air to be drawn by suction through the air inlet and up the main pipe into the combustion space and gas generated in the combustion space flowing into the space below the cinder bath space and thence through the serpentine passageway, and the gas outlet being open and the air inlet closed during upward gasification and air introduced into the combustion space and the cinder bath space, gas generated in the combustion space flowing down the main pipe and through the gas outlet into the space below the cinder bath space and thence through the serpentine passageway.

3,881,886
GRINDING MACHINES AND LOADING MECHANISM THEREFOR

Stanley William Hoare, Peterborough, England, assignor to The Newall Engineering Company Limited, Peterborough, England

Filed Oct. 30, 1973, Ser. No. 411,030
Int. Cl. B24b *5/22, 5/34, 49/20*
U.S. Cl. 51—5 D **11 Claims**



1. A loading mechanism for a grinding machine comprising:
a magazine for delivering a series of components to a loading station;
a slidable component carrier;
pneumatic means for applying pneumatic pressure to said series of components to transfer a component at the loading station from the magazine to the carrier;
means for moving the carrier from the loading station to a grinding station;
means on the carrier for receiving said component from the magazine at the loading station and for supporting the component during said movement of the carrier;
a rotary head disposed at the grinding station;
and a controllable magnet positioned for attracting said component from the carrier into engagement with the rotary head for rotation therewith.

9. A grinding machine including:
a grinding wheel disposed at a grinding station;
a grinding wheel dresser mechanism adjacent the grinding wheel;
a loading mechanism comprising a magazine for delivering a series of components to a loading station;
a slidable component carrier;
pneumatic means for applying pneumatic pressure to said series of components to transfer a component at the loading station from the magazine to the carrier;
means for moving the carrier between the loading station and the grinding station;

means on the carrier for receiving a component from the magazine at the loading station and for supporting the component during movement of the carrier from the loading station to the grinding station.

a rotary head disposed at the grinding station;

a controllable magnet positioned at the grinding station for attracting a component from the carrier into engagement with the rotary head for rotation therewith;

and means for advancing the grinding wheel dresser mechanism towards the grinding wheel by a predetermined distance to compensate for grinding wheel wear and for simultaneously advancing the loading mechanism towards the grinding wheel by the same predetermined distance.

3,881,887

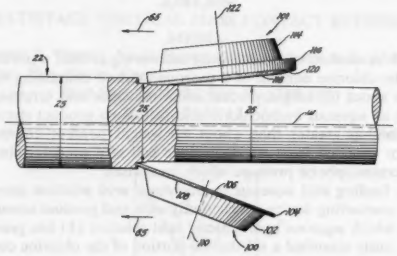
APPARATUS AND METHOD FOR GRINDING AN ELONGATED WORKPIECE

Harold A. McMaster, 707 Riverside Dr., Woodville, Ohio 43469

Continuation-in-part of Ser. No. 426,389, Dec. 19, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 456,915

Int. Cl. B24b *5/04*

U.S. Cl. 51—49 **24 Claims**



1. Apparatus for grinding a workpiece in the form of an elongated cylindrical roll from a rough diameter to a finish diameter comprising: support means for rotatably supporting the workpiece; and rotatable grinding means supported for movement in a path parallel to the axis of rotation of the workpiece, said grinding means including a rough-cutting grinding surface engageable with the workpiece in an undercutting relationship said grinding means being operable at least during the rough cutting operation to impose forces on the workpiece in a substantially axial direction only.

3,881,888

FIXTURE FOR HOLDING BLADES DURING GRINDING

Martin Schwab, Effretikon, Switzerland, assignor to Wilhelm Maier & Sohne oHG, Kongen, Switzerland

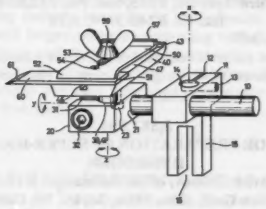
Filed July 2, 1973, Ser. No. 375,718

Claims priority, application Switzerland, July 27, 1972, 11237/72

Int. Cl. B23g *3/04*

U.S. Cl. 51—218 R **9 Claims**

1. A fixture for positioning the cutting element of a sewing machine for grinding on a grinding machine comprising an attachment body having a base adapted to be secured in a fixed position on said grinding machine, a first shaft fixed thereon, a separable block securable in selected angular and axial positions on said first shaft, a first bolt carried by said block extending along an axis perpendicular to said shaft, a clamping plate securable in selected angular and axial positions on said first bolt, a chuck for holding said cutting element, a second bolt integral with said chuck securable in said clamping plate in selected angular and axial positions along an axis perpendicular to the axis of said first bolt, said chuck comprising a bottom portion having a plurality of stepped planar surfaces perpendicular to said second bolt, each adapted to receive a cutting element, said stepped surfaces having transverse stop edges for locating said cutter element



thereon and a separable top member having a depending edge adapted to contact the surface of the cutting element and means for securing said top member to said bottom portion to clamp the cutting element therebetween.

3,881,889

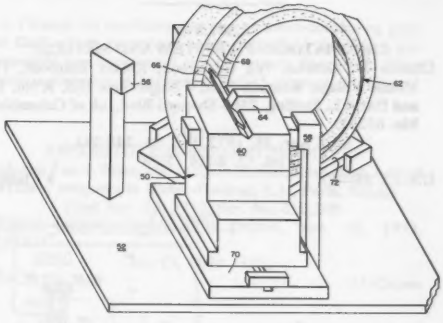
METHOD FOR RESHARPENING CUTTING BLADES AND CUTTER

Ernst J. Hunkeler, Fairport, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Dec. 27, 1973, Ser. No. 428,989

Int. Cl. B24b *3/36*

U.S. Cl. 51—288 **1 Claim**



1. A method for resharpening a cutting blade having (a) a front face **10,** (b) an end face **12,** (c) a first side face **14,** and (d) a second side face **16,** without removing a layer of stock from said front face **10,** said method being characterized by the steps of

moving said cutting blade relative to said abrading surface to remove stock from said end face **12** to form an end radius and a top relief angle E on the end face of the cutting blade,

relatively advancing said first side face **14** of the cutting blade into contact with an abrading surface so as to remove stock to form a pressure angle A and a side relief angle B on said first side face **14** of the cutting blade, this step also serving to define a cutting edge **18** between the first side face **14** and said front face **10** of the cutting blade, and

relatively advancing said second side face **16** into contact with an abrading surface so as to remove stock to form a clearance angle C and a side relief angle D on said second side face **16,** whereby critical angular relationships between front, end, and side faces of the cutting blade are maintained without removing a layer of stock from the front face.

3,881,890

ABRASIVE BORON NITRIDE PARTICLES CONTAINING PHOSPHORUS

John David Birle, Galloway, Ohio, assignor to General Electric Company, Columbus, Ohio

Filed Apr. 20, 1973, Ser. No. 352,884
Int. Cl. B24d *3/14, 3/28*
U.S. Cl. 51—307 8 Claims

1. Abrasive cubic boron nitride particles substantially saturated with about 0.042 weight percent of phosphorus.

3,881,891

METHOD FOR PREPARATION OF SUPER-HIGH PURITY HYDROGEN

Viktor Alexeevich Goltsov, ulitsa Belinskogo, 8/10, kv. 7; Pavel Vladimirovich Geld, ulitsa Mira, 36, kv. 78; Genrikh Efimovich Kagan, ulitsa Komsomolskaya, 50, kv. 77, and Nikolai Ivanovich Timofeev, prospekt Lenina, 62, korpus 5, kv. 17, all of Sverdlovsk, U.S.S.R.

Filed Feb. 12, 1973, Ser. No. 331,705
Int. Cl. B01d *53/22*
U.S. Cl. 55—16 3 Claims

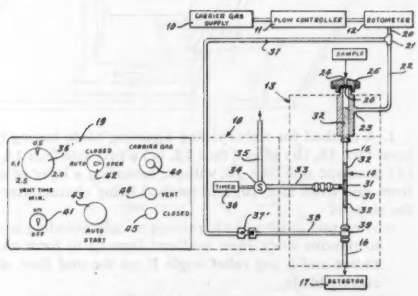
1. A process for the preparation of super-high purity hydrogen comprising adding water vapor to a gaseous mixture containing hydrogen to produce a partial pressure of water vapor between 5 and 760 mm of mercury in said gaseous mixture, and diffusing said gaseous mixture containing water vapor at a total pressure from 1 atmosphere to 300 atmospheres through a diaphragm made of palladium or its alloys heated to a temperature of 200°–900°C, wherein the pressure of the diffused pure hydrogen is maintained less than its partial pressure in the original mixture.

3,881,892

CHROMATOGRAPH SYSTEM AND METHOD

Charles W. Gehrke, 708 Edgewood; Robert Zumwalt, 17 Mobile Village; Kenneth Kuo, 4 Sugar Tree Hill, R No. 5, and David L. Stalling, 2505 Shepard Blvd., all of Columbia, Mo. 65201

Filed Apr. 28, 1972, Ser. No. 248,384
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 9 Claims



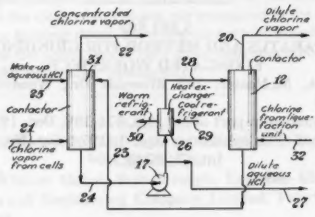
1. In combination, a gas chromatographic system having a pre-column with a flow regulated carrier gas supply and injection means through which a sample solution is injected for separation into solvent and sample compounds and movement thereof through said pre-column, and an analytical column adapted to receive sample compounds from said pre-column for analysis in a detection unit; a chromatograph accessory device comprising solvent venting means connected intermediate of the pre-column and analytical column, said solvent venting means being adapted to vent from the pre-column a substantial portion of the carrier gas and the solvent from said sample solution during conversion of the sample compounds into a detectable form in the precolumn, said solvent venting means including means for controlling said venting operation prior to movement of the sample compounds from the precolumn and past said accessory device to the analytical column.

3,881,893

CHLORINE RECOVERY WITH AQUEOUS HYDROCHLORIC ACID

Ravinder K. Badhwar, Sarnia, Ontario, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 4, 1972, Ser. No. 311,458
Int. Cl. B01d *53/02*
U.S. Cl. 55—71 15 Claims



15. A method of concurrently recovering at least a portion of the chlorine content of a gaseous mixture containing less than about 60 weight percent chlorine vapor and scrubbing with an aqueous hydrochloric acid solution a product stream containing greater than about 60 weight percent chlorine vapor supplied from an electrolytic cell at a predetermined superatmospheric pressure which comprises:

a. feeding said aqueous hydrochloric acid solution into a contacting device concurrently with said product stream, which aqueous hydrochloric acid solution (1) has previously absorbed a substantial portion of the chlorine content of said gaseous mixture by having contacted it while said gaseous mixture was at a pressure not less than that of said acid solution, and (2) is under a pressure higher than said predetermined pressure,

b. scrubbing, in said contacting device at substantially said predetermined pressure, impurities from said product stream, which impurities enter into said aqueous hydrochloric acid solution,

c. releasing at least a portion of the chlorine content of said aqueous hydrochloric acid solution as a vapor by exposure of said aqueous hydrochloric acid solution to pressure reduction within said contacting device, which reduction is due to the difference between said predetermined pressure of the chlorine vapor in the contacting device and the higher pressure of said aqueous hydrochloric acid solution admitted thereto,

d. separating said scrubbed product stream vapor from said aqueous hydrochloric acid solution containing said impurities, and

e. reusing said aqueous hydrochloric separated acid solution to recover chlorine from said gaseous mixture.

3,881,894

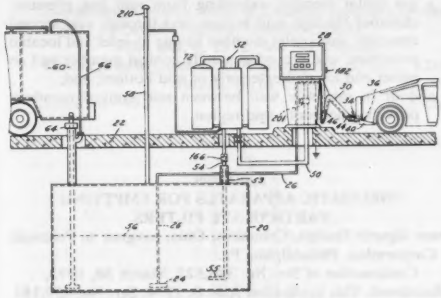
VAPOR EMISSION CONTROL SYSTEM AND METHOD

George R. Onufer, 8317 Woodcrest Dr. Apt. 4, Westland, Mich. 48184

Filed Oct. 5, 1972, Ser. No. 295,284
Int. Cl. B01d *53/04*
U.S. Cl. 55—88 4 Claims

1. The method of recovering fuel vapors emanating from refueling of a tank with volatile liquid fuel and returning them to stored liquid fuel for subsequent refueling use, comprising: entraining the vapors in an atmospheric air stream as they are generated during refueling of the tank,

collecting the vapor-entrained air stream,



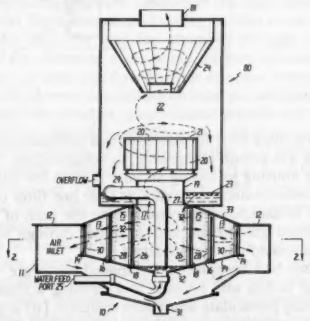
separating the vapors from the atmospheric air stream, and passing the vapors through a labyrinth of microscopic passageways immersed in stored liquid fuel to dissolve substantially all the vapors therein.

3,881,895

MULTISTAGE VORTICAL MASS CONTACT BETWEEN MEDIA

Gurdon B. Wattles, North Haven, Conn., assignor to Entoleter, Inc., New Haven, Conn.

Filed Dec. 26, 1972, Ser. No. 318,683
Int. Cl. B01d *53/14*
U.S. Cl. 55—87 **13 Claims**



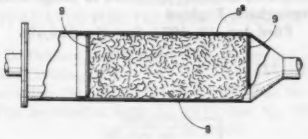
1. A multistage vortical mass contactor comprising at least first and second vortical contact stages, each of said stages comprising a vaned louvered wall arranged in overall circular configuration with the vanes thereof oriented at an angle between tangential and orthogonal to said circular configuration, the two louvered walls being substantially concentric and being substantially coplanar with one being located inside the other end spaced radially inward therefrom defining an annular space between said walls, housing means at the axial ends of said walls closing the axial ends of said annular space, the inner wall defining a cylindrical space, additional housing means closing one axial end of said cylindrical space, said cylindrical space having an opening at the other axial end thereof, the vanes of both said walls extending substantially the full axial length of the respective walls and being spaced from each other circumferentially about said walls to provide openings therebetween that extend uninterruptedly for substantially the full axial length of the respective walls, said vanes having apertures therein, means for forcing a first, continuous phase medium to flow from the exterior of said outer louvered wall therethrough and into said annular space and thence through the inner louvered wall into said cylindrical space and thence through said opening, whereby a vortical flow of said medium is established in each of said stages, and means for introducing a second medium into the flow of said first medium, whereby said second medium is suspended in particulate form in said first medium and is caused to circulate as an annular cloud in each of said stages with larger particles migrating radially outwardly in said clouds and smaller particles migrating radially inwardly in said clouds, and with a portion of said larger particles migrating radially outwardly from said clouds and through said apertures in said vanes of said louvered walls and a portion of said smaller particles migrating radially inwardly from said clouds entrained in the flow of said first medium.

3,881,896

APPARATUS FOR FILTERING GASEOUS FLUIDS

Willy Rothmayr, La Tour De Peilz, and Jaroslav Dasek, Yverdon, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 18, 1972, Ser. No. 298,554
Claims priority, application Switzerland, Oct. 19, 1971, 15207/71
Int. Cl. B01d *46/00*
U.S. Cl. 55—97 **2 Claims**



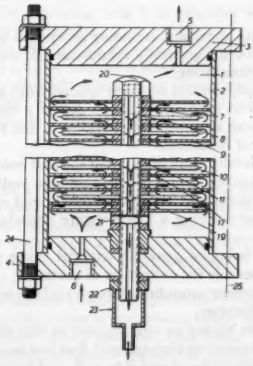
1. Process for sterilizing a microorganism-containing gaseous fluid which comprises passing the fluid through a gas-permeable non-compacted mass of quartz fibers, said fibers having a diameter of between 5 and 15 microns.

3,881,897

APPARATUS FOR SEPARATING FLUIDS

Alphonse Faure, Bron, and Jacques Baudet, Roussillon, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Nov. 23, 1973, Ser. No. 418,200
Claims priority, application France, Nov. 24, 1972, 72.41821
Int. Cl. B01d *53/22*
U.S. Cl. 55—158 **15 Claims**



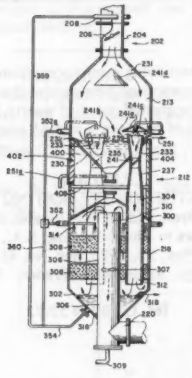
1. Apparatus for separating fluids, said apparatus comprising, in combination:

a. a jacket;

b. an inlet for feeding a fluid to be treated to said jacket;

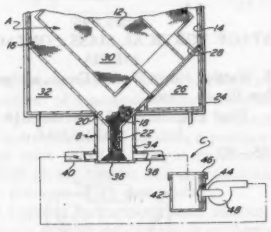
c. an outlet for removing treated fluid from the jacket;
d. a stack of spaced apart elementary cells located within said jacket, between said inlet and outlet, each said cell including a porous support, a membrane wall of a polymeric material on each plane face of said support and means defining an aperture through said cell;
e. means defining a flow passage for fluid at the edge of each cell;
f. at least one baffle in contact with the internal wall of said jacket and extending thereacross between said cells, the said baffle being held, in a detachable manner, in the jacket by the stack of spaced apart elementary cells;
g. at least one conduit for the recovery of the fluid which has passed through the membrane walls, said conduit passing through said apertures in said cells, the cells being held in a leakproof manner onto the conduit, the conduit discharging exteriorly of the jacket; and
h. means defining at least one aperture in each said baffle in the vicinity of said conduit.

3,881,898
GAS TREATMENT
Kenneth Darby; Bernard Tate, and Charles Graham Smith, all of Birmingham, England, assignors to Lodge-Cottrell Limited, Birmingham, England
Filed Jan. 18, 1973, Ser. No. 324,696
Int. Cl. B01d
U.S. Cl. 55—223 **8 Claims**



1. Gas treating apparatus including an upright tower having a top, a bottom and a generally cylindrical side wall extending therebetween comprising:
a first generally conical member spaced from said top and connected to said side wall to define a high pressure chamber with said top and providing a first reservoir for collection of moisture;
a second generally conical member located below said first conical member connected to said side wall defining a region between said conical members and spaced from said bottom defining a low pressure chamber with said bottom;
said bottom being of generally conical shape providing a second reservoir for collection of moisture;
a gas inlet member extending through said top into said high pressure chamber;
conduit means having an inlet located in said high pressure chamber, extending through said first and second conical members interiorly of said side wall, and having an outlet in said low pressure chamber proximate said second reservoir;
gas pressure reducing means located in said conduit means;
spray means for spraying liquid into said conduit means;
cooling means in said low pressure chamber for reducing the temperature of the gas;
a gas outlet member extending from said low pressure chamber through said bottom and through said second reservoir, said outlet member having an inlet end located proximate said second generally conical member and an outlet end located exteriorly of said bottom; and,
a door in said side wall between said conical members providing access to said region.

3,881,899
PNEUMATIC APPARATUS FOR EMPTYING PARTICULATE FILTERS
Ivars Sigurds Spulgis, Columbus, Ohio, assignor to Pennwalt Corporation, Philadelphia, Pa.
Continuation of Ser. No. 346,522, March 30, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 459,154
Int. Cl. B01d *53/04*
U.S. Cl. 55—387 **3 Claims**

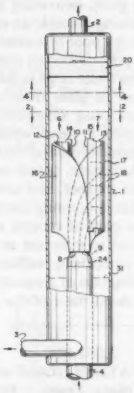


1. A particulate filter for adsorption of radioactive contamination in a gas stream comprising, in combination:
a closed housing including an inlet therein for introducing the contaminated gas stream, at least one filter bed interposed in said housing transverse to the path of the contaminated gas stream, and an outlet through which decontaminated gas is discharged,
each filter bed comprising (i) spaced perforate walls arranged within said housing and defining a chamber for receiving particulate absorptive material, (ii) a hopper at the upper portion of said chamber into which the particulate material is loaded, and (iii) evacuation means at the lower portion of said chamber for draining the particulate material therefrom when the adsorptive efficacy of said material is expended,
said evacuation means including (a) a funnel downwardly projecting from said chamber and terminating in a vertically disposed spout, (b) a well enclosing at least the lower portion of said spout and having a floor spaced from the lower end thereof, (c) first and second conduits in communication with said well, (e) a closed tank coupled with said first conduit, (f) blower means coupling said second conduit with said tank in a closed path, and (g) a porous receptacle in said tank interposed in the path of travel through said conduits for collecting the spent particulate material,
whereby the particulate material will fall to the floor of said well in a pile until the angle of repose thereof effects closure of the lower end of the spout, said evacuation means upon actuation of said blower means pneumatically sweeping the particulate material up from the pile in an entirely closed circuit such that radioactive contaminants are always retained in encapsulated disposition and never released into the environment.

3,881,900
GAS LIQUID SEPARATOR

Douglas B. Campbell, Deep River, and Edward A. Reeves, Downsview, Ontario, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Oct. 6, 1972, Ser. No. 295,603
Claims priority, application Canada, Oct. 6, 1971, 124538
Int. Cl. B01d 45/16
U.S. Cl. 55—416 5 Claims



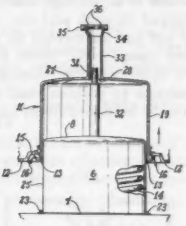
1. A gas-liquid separator comprising an elongated substantially vertically disposed cylindrical chamber having an upper gas outlet and a lower liquid outlet, an inlet conduit extending coaxially upwardly into the chamber through a lower wall thereof for directing a gas-liquid mixture upwardly into said chamber, at least one flow diverter disposed within said chamber, each diverter comprising an inlet portion communicating with said inlet conduit, a curvilinear transitional tubular portion curving smoothly radially outwardly from a substantially vertical orientation at the inlet portion and terminating with a horizontally oriented outlet portion that extends circumferentially around a substantially vertically extending axis and wherein said outlet portion is vertically elongated such that the mixture leaves in a sheetlike configuration against an inner surface of the chamber thereby inducing a circular flow of gas in a given direction in said chamber, each diverter having a substantially constant cross-sectional area throughout its length, and a plurality of spaced vanes disposed within and extending substantially throughout the total length of each diverter for dividing said diverter into a plurality of channels, said channels being disposed substantially vertically with respect to one another at said outlet.

3,881,901
LIQUID COOLING APPARATUS

Patrick Robert Williams, Mt. Eliza, Victoria, Australia, assignor to Heine Brothers (Sales) Pty. Ltd., Melbourne, Victoria, Australia

Filed Nov. 16, 1973, Ser. No. 416,447
Claims priority, application Australia, Nov. 21, 1972, 1310/72
Int. Cl. B67d 5/62
U.S. Cl. 62—392 5 Claims

1. Liquid cooling apparatus including a liquid container having a plurality of walls; a sleeve secured to one of said walls and projecting into said container to define a cavity within said container; a heat transfer element located in said cavity and being operable during a cooling phase of said apparatus to draw heat from said liquid container; said sleeve and said heat transfer element being relatively dimensioned so that a space is defined between their adjacent surfaces; and a liquid contained within said space to form a jacket about said heat transfer element; said jacket liquid being such as to form a heat conduction path between said sleeve and said heat transfer element during at least part of said cooling phase, and said

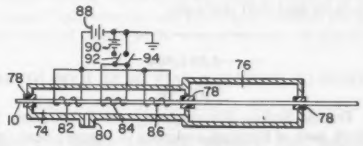


jacket liquid being such that it will freeze near the end of said cooling phase and in the absence of liquid freezing within said container so as to inhibit transfer of heat between said heat transfer element and said liquid container.

3,881,902
APPARATUS FOR TREATING GLASS OPTICAL WAVEGUIDE FIBERS

Robert D. DeLuca, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 215,319, Jan. 4, 1972, Pat. No. 3,788,827.
This application Sept. 20, 1973, Ser. No. 399,089
Int. Cl. C03b 25/00
U.S. Cl. 65—12 18 Claims



1. Apparatus for treating a glass optical waveguide fiber comprising

a first chamber having fiber input and output openings in opposing ends thereof, said fiber being adapted to pass through said fiber input opening into said chamber and thereafter pass from said chamber through said fiber output opening,

means for providing said first chamber with a first controlled atmosphere,

means for providing a gaseous discharge in said first chamber to remove surface contaminants from said fiber, and means disposed at said fiber output opening for treating said fiber before the surface thereof can become recontaminated.

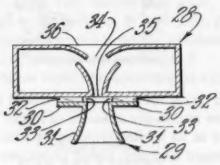
3,881,903
APPARATUS FOR PRODUCING GLASS FIBERS

Charles J. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 4, 1974, Ser. No. 457,883
Int. Cl. C03b 37/06
U.S. Cl. 65—16 11 Claims

1. Apparatus for producing curly fibers from a thermoplastic fiber forming material comprising feeder means for holding a molten body of the material, said feeder means having a plurality of orifices formed therein for issuing at least one row of streams of molten material, blower means including a housing disposed beneath said feeder means having a pressure chamber formed therein and having an elongated walled vertical slot closed by end walls extending through the housing and

defining inlet and outlet openings for receiving and discharging such streams of material, said housing having means formed along said slot for the issuance of jets of gaseous fluid from said pressure chamber into said slot, said last named means being so positioned with respect to said slot as to induce an augmented flow of air through said slot inlet by such fluid jets and discharged through said slot outlet with such fluid jets, such fluid jets and augmented air flow attenuating the streams of molten material into fibers, and gaseous fluid expansion means for appreciably decreasing the velocity of and imparting turbulence to gaseous fluid discharged from said slot outlet before the entrained fibers have set, said gaseous fluid expansion means comprising skirt means having two sidewalls curving downwardly and outwardly from adjacent elongated sides of said slot outlet to cause a decrease in the velocity of the attenuated fibers and the fluid discharged from said slot outlet and to impart turbulence to the gaseous fluid discharged from said slot outlet whereby the attenuated fibers take on a random curly configuration as such fibers harden, said skirt means being spaced below said blower means whereby ambient air is induced by the expanding fluid to flow through such spacing and along said skirt sidewalls, such induced ambient air flow preventing the attenuated fibers from striking said skirt sidewalls.



3,881,904

METHOD OF JOINING A PAIR OF SILICON NITRIDE PARTS

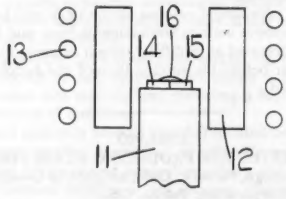
Roger Francis Stokes, Birmingham, and Brian John Hunt, Solihull, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Division of Ser. No. 234,620, March 14, 1970. This application Feb. 13, 1974, Ser. No. 441,994

Claims priority, application United Kingdom, Mar. 24, 1971, 7874/71; May 21, 1971, 16452/71

Int. Cl. C03c *27/00*

U.S. Cl. 65—43 **4 Claims**



1. A method of joining a pair of silicon nitride parts comprising the steps of:

a. providing on at least one of the parts to be joined a powdered glass consisting of between 50 and 80 percent by weight silica, between 10 and 40 percent by weight alumina, and between 10 and 25 percent by weight magnesium oxide, and

b. heating the powdered glass so as to produce molten glass between the parts whereby, on cooling, the glass provides a joint between the parts.

3,881,905

METHOD OF MANUFACTURE OF METAL OXIDE-CONTAINING COLORED GLASS

Deane G. Cramer, Festus; Paul W. Kopp, and Manuel J. Riolo, both of Crystal City, all of Mo., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,438

Int. Cl. C03b *18/02*

U.S. Cl. 65—65 A **10 Claims**

1. In the method of making flat glass comprising the steps of melting and refining glass, delivering molten glass onto a pool of molten tin containing metal in an enclosed chamber to form a body of glass on the pool of molten metal and cooling the body of glass on the pool of molten metal to form a dimensionally stable continuous sheet of glass therefrom and removing the continuous sheet of glass from the pool of molten metal and from the enclosed chamber, the improvement wherein the glass contains at least about 0.03 percent by weight (analyzed) of a reducible metal oxide selected from the group consisting of nickel oxide, cobalt oxide, copper oxide, silver oxide and mixtures thereof, and comprising the step of feeding an atmosphere gas containing nitrogen to the enclosed chamber containing the pool of molten metal at a rate and nitrogen content sufficient to maintain an atmosphere within the enclosed chamber comprising sufficient oxygen to substantially prevent the formation of a visually observable metal-containing material on the surface of the glass.

3,881,906

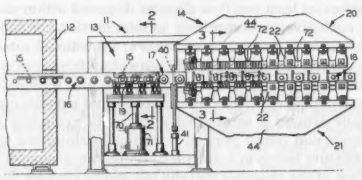
HEAT TREATING GLASS SHEETS

George F. Ritter, Jr., Toledo; Frank J. Hymore, Oregon, and Donald D. Rahrig, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 20, 1973, Ser. No. 390,110

Int. Cl. C03b *27/00*

U.S. Cl. 65—104 **11 Claims**



1. In a method of bending and tempering glass in which a succession of flat glass sheets are supported in substantially horizontal position and moved along a predetermined path through a heating area in which the glass is heated to substantially its point of softening, a bending area in which the heated sheets are shaped to a final desired contour, and a chilling area in which streams of cooling fluid are directed against opposite surfaces of the heated and bent glass sheets to temper them; the improvements which comprise providing a passageway for bent glass sheets between said bending and said chilling areas, opening said passageway during movement of heated and bent sheets from the former to the latter area, and maintaining said passageway closed at all other times; and angling certain of said streams of cooling fluid that are at the entrance end of said chilling area by directing the same through tubes toward and in the direction of travel of said glass sheets, and directing subsequent streams of cooling fluid from openings in trap-free surfaces toward and against the surfaces of said sheets.

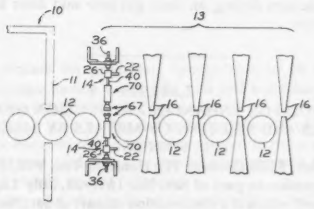
5. In apparatus for bending and tempering glass comprising means for supporting a succession of flat glass sheets in substantially horizontal position and for moving the same along a predetermined path through a heating area which includes means for heating the glass to substantially its point of softening, a bending area which includes means for shaping heated sheets to a desired final contour, and a chilling area which includes upper and lower blast heads for directing cooling

fluid against opposite surfaces of heated and bent sheets moving along said path; the improvement in which said blast heads include means adjacent the entrance end of said chilling area comprising a plurality of tubes that vary in length from side to side of said path in substantial conformance with the transverse curvature of the glass sheets being tempered for directing said fluid in a plurality of streams angled toward a surface and in the direction of travel of said heated and bent sheets to direct and draw said sheets into the space between said upper and lower blast heads.

3,881,907
METHOD OF TEMPERING GLASS SHEETS

Eugene W. Starr, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1974, Ser. No. 438,070
Int. Cl. C03b *27/00*
U.S. Cl. 65—114 **2 Claims**



1. A method of tempering a glass sheet comprising,
heating said glass sheet to an elevated temperature sufficient for tempering,
cooling a gas in a vortex tube,
supplying said cooled gas to a first stage of tempering,
conveying said heated glass sheet through said first stage of tempering,
cooling said heated glass sheet with said cooled gas as it traverses said first stage of tempering at a rate of flow sufficient to at least temporarily harden and increase the resistance of the surface of said sheet to deformation,
supplying additional tempering gas without cooling to a second stage of tempering that immediately follows said first stage, and
further cooling said glass sheet with said additional tempering gas as it traverses said second stage of tempering at a rate of flow and for a period of time sufficient to effect a tempered condition in said glass sheet.

3,881,908
HERBICIDAL N-HALOACYL (2-SPIROCYCLOALIPHATIC) OXAZOLIDINES

Kenneth P. Dorschner, Jacksonville, Fla., and James A. Albright, St. Louis, Mich., assignors to SCM Corporation, Cleveland, Ohio

Division of Ser. No. 280,836, Aug. 15, 1972. This application July 27, 1973, Ser. No. 383,348
Int. Cl. A01n *9/22*
U.S. Cl. 71—88 **12 Claims**

1. A process for controlling undesirable growth of vegetation which comprises applying to the locus thereof a herbicidally effective amount of an N-haloacyl (2-spirocycloaliphatic) oxazolidine wherein the haloacyl is C_{2-4} acyl, the 4 and 5 carbon atom valences are satisfied by hydrogen atoms or C_{1-6} alkyl groups, and said spirocycloaliphatic group is cyclopentyl, cyclohexyl, cyclohexenyl or cycloheptyl.

3,881,909
ALPHA-BROMOACRYLIC-ACID-ANILIDE FRUIT ABSCISSION AGENTS

Henry Martin, Basel, Switzerland, and Georg Pissiotas, Loerrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

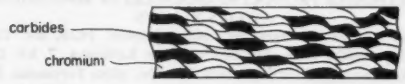
Division of Ser. No. 166,575, July 27, 1971, Pat. No. 3,758,579. This application Dec. 7, 1972, Ser. No. 313,049
Claims priority, application Switzerland, July 31, 1970, 011589
Int. Cl. A01n *9/20*
U.S. Cl. 71—118 **6 Claims**

1. A composition for the regulation of citrus fruit and olive abscission comprising an effective amount of α-bromoacrylic-acid-2-methyl-anilide together with a suitable inert carrier.

3,881,910
CHROMIUM-CHROMIUM CARBIDE POWDER

John Franklin Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 15, 1973, Ser. No. 388,434
Int. Cl. B22f *1/00*
U.S. Cl. 75—.5 R **2 Claims**



1. A powder for deposition by a process taken from class consisting of plasma and detonation-gun type processes consisting essentially of a mixture of chromium and at least one chromium carbide taken from the class consisting of $Cr_{23}C_6$; Cr_7C_3 and Cr_3C_2 wherein said chromium carbides are present in the range of from 3 to 30 volume percent of said mixture.

3,881,911
FREE FLOWING, SINTERED, REFRACTORY AGGLOMERATES

Richard F. Cheney, Towanda; David J. Port, Athens, and James R. Spencer, Sayre, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 1, 1973, Ser. No. 411,663
Int. Cl. C22c *1/04, 1/05;* **C04b** *35/52, 35/58*
U.S. Cl. 75—.5 BB **4 Claims**

1. A free flowing flame spray powder consisting essentially of particle agglomerates, characterized in that the agglomerates consist essentially of subparticles of at least one inorganic material having a melting point above 1,800°C, the inorganic material selected from the group consisting of the refractory metals W, Mo, Cr, Ta, Nb, their alloys, and the oxide, boride, carbide and nitride compounds of these refractory metals, the subparticles held together by diffusion bonds to one another and having diameters up to 1/5 the diameters of the agglomerates, and at least 80% of the agglomerates having sizes within a range of 30 microns.

3,881,912
WELDING FILLER MATERIAL

John Mikurak, Darby, Pa., assignor to Hoeganaes Corporation, Riverton, N.J.

Filed Dec. 28, 1973, Ser. No. 429,184
Int. Cl. C22c *39/30;* **B23k** *35/02*
U.S. Cl. 75—.5 BA **15 Claims**

1. An atomized welding filler material for submerged arc welding consisting essentially of by weight: (a) from 0.01 percent to 0.05 percent carbon; (b) 0.15 percent to 2.0 percent manganese; (c) from 0.01 percent to 0.15 percent silicon; (d) less than or equal to 0.020 percent sulphur; (e) less than or equal to 0.015 percent phosphorus; (f) less than or equal to 0.25 percent chromium; (g) from 0.01 percent to 2.0

percent nickel; (h) from 0.01 to 1.00 percent molybdenum and (i) the balance being iron, said atomized filler material having particle sizes less than about No. 20 sieve, with less than 5.0 percent by weight of said filler material particles having a particle size less than a No. 200 sieve.

12. An atomized alloy iron filler matieral for submerged arc welding consisting essentially of a multiplicity of discrete, spheroidally contoured particles, each of said particles having a substantially equal chemical composition, said particles having particle sizes less than about No. 20 sieve and has been inserted to overcome the rejections of record; and a size distribution anaylsis wherein less than 5.0 percent by weight of said filler material particles have a particle size less than a No. 200 sieve said filler material having a chemical composition of said particles consisting essentially by weights of: (a) from 0.01 percent to 0.05 percent carbon; (b) from 0.15 percent to 2.0 percent manganese; (c) a predetermined weight percentage of alloying constituents selected from the group consisting of silicon, sulphur, phosphorus, chromium, nickel and molybdenum and mixtures thereof; and the balance being iron.

3,881,913
METHOD OF PRODUCING GRANULES OF MAGNESIUM AND ITS ALLOYS

Ivan Andreevich Barannik, ulitsa Lenina, 182a, kv. 22, Zaporozhie; Ivanovich Belkin, ulitsa Kaliinaya, 7, kv. 13, Solikamsk; Viktor Ivanovich Borodin, ulitsa Fersmana, 18, kv. 13, Apatity Murmanskoi oblasti; Natalya Alexandrovna Voronova, pereulok Uritskogo, 11, kv. 4, Dnepropetrovsk; Oleg Nikolaevich Romanenko, ulitsa Sevastopolskaya, 6, kv. 46, Kalush Ivano-Frankovskoi oblasti; Alexandr Petrovich Bogdanov, bulvar Tsentralny, 3, kv. 44, Zaporozhie; Valery Sergeevich Belosludtsev, ulitsa Kaliinaya, 114, kv. 13; Vladimir Dmitrievich Marfin, ulitsa Kaliinaya, 153, kv. 153, both of Solikamsk; Nikolai Yakovlevich Shish, ulitsa Gryaznova, 88 kv. 3, Zaporozhie; Anatoly Filippovich Shevchenko, ulitsa G. Pushkina, 1b, kv. 52; Ivan Yakovlevich Emelyanov, ulitsa, G. Pushkina, 1b, kv. 58, both of Dnepropetrovsk; Jury Nikolaevich Boiko, prospekt Lenina, 155, kv. 10, Zaporozhie; Mikhail Nikolaevich Kljuchnik, ulitsa Kalinovaya, 94, kv. 46, Dnepropetrovsk; Nikolai Vasilievich Khaber, ulitsa Sevastopolskaya, 4, kv. 6, Kalush Ivano-Frankovskoi oblasti; Viktor Georgievich Raskatov, ulitsa Khimikov, 14, kv. 18, Kalush Ivano-Frankovskoi oblasti; Alexandr Fedorovich Trukhin, ulitsa Zhdanova, 11, kv. 32, Kalush Ivano-Frankovskoi oblasti; Anatoly Borisovich Kondratenko, ulitsa Sevastopolskaya, 4, kv. 6, Kalush Ivano-Frankovskoi oblasti; Vladimir Dmitrievich Yazev, ulitsa Bogdana Khmelnitskogo, 66, kv. 59, Kalush Ivano-Frankovskoi oblasti; Viktor Stephanovich Alontsev, ultisa Kaliinaya, 124, kv. 15; Valery Alexeevich Startsev, ulitsa Kaliinaya, 124, kv. 4, both of Solikamsk, and Jury Alexandrovich Sergeev, prospekt Lenina, 182a, kv. 23, Zaporozhie, all of U.S.S.R.

Filed Feb. 19, 1974, Ser. No. 443,845
Int. Cl. B22d *23/08*
U.S. Cl. 75—.5 C **11 Claims**

1. A method of producing granules of magnesium or its alloys including: heating liquid magnesium or its alloy to a temperature within the range of 670°–720°C; preparing a salt addition which is a mixture of magnesium chloride and at least one component selected from the group consisting of alkali and alkaline-earth metal chlorides taken in such combination and in such quantitative composition that the initial crystallization temperature of the salt addition is below that of magnesium, and its density at 670°–730°C is equal to 0.95–1.20 of the density of liquid magnesium or its alloy; heating said salt addition to a temperature within the range of 670°–730°C; simultaneously delivering said liquid magnesium or its alloy and the salt addition in continuous streams into a centrifugal granulator; breaking the mixture of liquid magnesium or its alloy and the salt addition into discrete liquid particles by the action of the centrifugal force; cooling in air the discrete liquid particles until their solidification in the form of granules of magnesium or its alloy, coated with a shell of said salt addition, and granules of the same salt addition.

3,881,914
PREPARATION OF ELECTRONIC GRADE COPPER

Eric X. Heidelberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

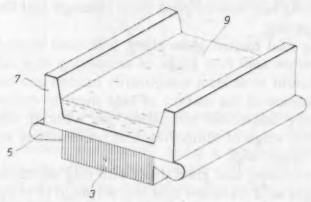
Filed Apr. 26, 1974, Ser. No. 464,356
Int. Cl. C22b *15/12;* **B22f** *9/00*
U.S. Cl. 75—.5 A **17 Claims**

12. The process for producing small particle size, pure, elemental copper suitable for use in manufacturing thick film conductive circuits which comprises: reacting a system consisting essentially of copper sulfate or copper acetate, hypophosphorous acid and water so as to form elemental copper, the amount of hypophosphorous acid being at least about 2 moles per mole of sulfate or acetate; separating said elemental copper from said reacted system; washing said separated copper with a water miscible inert organic solvent; vacuum drying said washed copper and introducing, upon completion of said vacuum drying, an inert gas into said drier to release the vacuum.

3,881,915
METHOD FOR ENHANCING REDUCTION OF ORES, OXIDES AND MELTING OF METALS BY MAGNETIC FORCES

Sam Proler, 5106 Contour Pl., Houston, Tex. 77035

Continuation-in-part of Ser. No. 161,905, July 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 29,325, March 30, 1970, abandoned. This application Nov. 14, 1972, Ser. No. 306,429
Int. Cl. C21c *5/52*
U.S. Cl. 75—11 **46 Claims**



1. The method for continuously processing metal particles having magnetic characteristics comprising the steps of:

providing a moving molten metal stream,

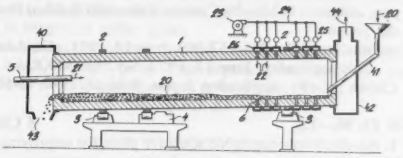
disposing a magnetic field substantially with lines of flux extending through the surface of the stream, said lines of flux extending substantially perpendicular to the surface of the said stream,

introducing into the stream a substantially continuous charge of metal particles which have magnetic characteristics so that the magnetic field forces said particles into and beneath the stream surface and continues to draw said particles downwardly and hold them beneath the stream surface so long as their magnetic characteristics exist, thereby enhancing exposure of the particles to the surrounding heat of the stream and facilitating their ultimate reduction.

3,881,916
PROCESS FOR THE PRODUCTION OF SPONGE IRON

Harry Serbent, Schoneck; Wilhelm Thumm, Frankfurt am Main, and Horst Nagel, Bergen-Enkheim, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 15, 1973, Ser. No. 388,353
Claims priority, application Germany, Aug. 22, 1973, 2241168
Int. Cl. C21b *13/08*
U.S. Cl. 75—36 12 Claims



1. A process for producing sponge iron in an elongated rotary furnace having a charging end and a discharging end, said process comprising the steps of:

introducing iron oxide and substantially all of the solid carbonaceous reducing agent required to reduce said iron oxide into said furnace at said charging end to form a solid charge in said furnace;

displacing said charge in said furnace from said charging end to said discharging end while reacting it with said solid carbonaceous reducing agent between said ends;

heating said charge between said ends to a temperature sufficient to sustain reduction of the iron oxide but below the melting point of the charge by combustion of part of said solid carbonaceous reducing agent to produce furnace gases traversing said furnace substantially from one of said ends to the other of said ends; and

injecting a stream of oxygen-containing gas into said furnace at said one end cocurrently to the flow of the kiln atmosphere substantially parallel to the axis of the furnace with a velocity of at least 50 m/sec and sufficient that no impingment upon said charge occurs and said stream maintains its identity over at least a major portion of the length of said furnace whereby the oxygen of said stream is consumed continuously in the successive furnace zones.

3,881,917
METHOD OF REFINING STEEL

Crawford B. Murton, 1906 Brushcliff Rd., Pittsburgh, Pa. 15221

Filed Jan. 21, 1974, Ser. No. 435,093
Int. Cl. C21c *7/00*; C22b *9/10*
U.S. Cl. 75—52 9 Claims

1. A steel refining process for facilitating the solution of solid lime by inhibiting the formation of dicalcium silicate, comprising the steps of

a. heating and oxidizing a molten iron-base metal,

b. adding solid burnt lime to the molten iron-base metal, and

c. adding material of high basicity and of a melting point lower than that of solid burnt lime together with a mixture of fluorspar and oxides of iron, manganese, silicon, magnesium, and calcium, which oxides have melting points of from about 2,000° to 2,800°F, to provide a slag devoid of encapsulated solid bodies of burnt lime.

3,881,918
COBALT-BASE SUPERALLOY

Darryl J. Costin, and James B. Ford, both of Columbus, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 9, 1974, Ser. No. 468,360
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 8 Claims

1. High temperature, load-bearing oxidation resistant apparatus in the form of vacuum investment castings, said apparatus being fabricated from an alloy consisting essentially of:

Element	Percent by Weight
Chromium	22.5 – 29.0
Nickel	8.0 – 10.5
Tungsten	6.0 – 9.0
Zirconium	0.8 – 2.0
Silicon	0.8 – 1.5
Iron	0.35 – 0.50
Carbon	0.25 – 0.45
Yttrium	0.10 – 0.15
Dysprosium	0.05 – 0.15
Cobalt	Balance

wherein the alloy possess high temperature stress rupture strength and oxidation resistance.

3,881,919
TERNARY ALLOYS

Jacob Hyner, and Robert A. Michelson, both of Waterbury, Conn., assignors to Whyco Chromium Company Inc., Thomaston, Conn.

Filed Jan. 7, 1974, Ser. No. 431,025
Int. Cl. C22c *13/00*
U.S. Cl. 75—175 R 3 Claims

1. A bright, tarnish resistant and color stable ternary alloy consisting essentially of about

40 – 90 wt. % tin

10 – 50 wt. % cobalt

1 – 28 wt. % third metal

wherein said third metal is antimony or a metal of Periodic Group II_B, III_A or VI_B.

3,881,920
PHOTOELECTROPHORETIC IMAGING PROCESS

Leonard M. Carreira, Penfield, and Vsevolod Tulagin, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 863,106, Oct. 2, 1969, abandoned. This application Aug. 6, 1971, Ser. No. 169,664
Int. Cl. G03g *13/22*; B01k *5/02*
U.S. Cl. 96—1 PE 2 Claims

1. In the method of photoelectrophoretic imaging wherein a layer of an imaging suspension comprising electrically photosensitive yellow particles, magenta particles and cyan particles dispersed in an insulating carrier liquid and being responsive mainly to blue light, green light and red light, respectively, is provided between a transparent conductive electrode and a second electrode having an insulating surface in contact with said suspension and the suspension is exposed to a pattern of electromagnetic radiation containing wavelengths to which particles of at least two differing colors are sensitive and a potential difference is applied beween said first and said second electrodes until an image is formed, the improvement which comprises removing from said pattern of electromagnetic radiation wavelengths of radiation in the infrared spectral region.

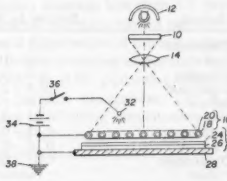
3,881,921
ELECTROPHOTOGRAPHIC PROCESS EMPLOYING IMAGE AND CONTROL GRID MEANS

Lee F. Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 185,647, Oct. 1, 1971, abandoned, which is a division of Ser. No. 492,988, Sept. 27, 1965, Pat. No. 3,680,954. This application July 23, 1973, Ser. No. 381,839

Int. Cl. G03g *13/00*

U.S. Cl. 96—1 R **18 Claims**



1. An electrographic process for producing a reproducible electrostatic charge image corresponding to an image to be recorded, on a radiation responsive image grid means comprising an electrically conductive core coated on one side with a layer of photoconductive insulating material sensitive to radiant energy and on the other side with an electrically insulating material, said process comprising the steps of:

uniformly charging the photoconductive layer on said image grid means by directing a flow of ions from an ion generating source through an electrically conductive control grid means onto the photoconductive layer while maintaining said control grid means at a predetermined potential relative to said source for limiting the charge level on said photoconductive layer; and

subsequently exposing said uniformly charged photoconductive layer through said control grid means, while maintaining said charge level, to a radiation image for producing a corresponding electrostatic image on said photoconductive layer, the image grid means and control grid means modulating any subsequent flow of ions directed thereto.

3,881,922
PHOTOCONDUCTOR AND PROCESS FOR THE PREPARATION THEREOF

Bernd Löhr, Wiesbaden, and Heinz Hermann, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft

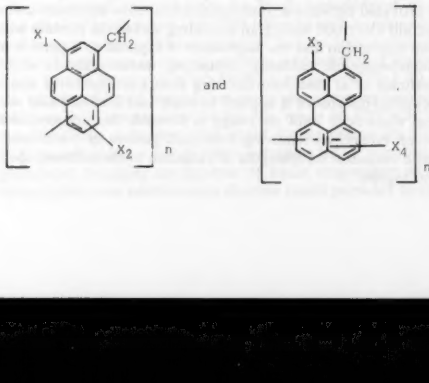
Division of Ser. No. 274,725, July 24, 1972. This application Apr. 19, 1973, Ser. No. 352,498

Claims priority, application Germany, July 26, 1971, 2137288; June 10, 1972, 2228446

Int. Cl. G03g *7/00*

U.S. Cl. 96—1.5 **4 Claims**

1. A photoconductive polymer condensation product, of formaldehyde or para-formaldehyde and at least one multinuclear, carbocyclic aromatic compound, composed of recurrent, non cross-linked units of at least one of the following formulae



wherein

X_1 and X_2 are selected from the group consisting of hydrogen, alkyl or alkoxy with 1 to 4 carbon atoms each, or halogen,

X_3 and X_4 are selected from the group consisting of alkyl or alkoxy with 1 to 4 carbon atoms each, or halogen, and

n is an integer between about 6 and 10,

said product being soluble in tetrahydrofuran at room temperature, and containing 0.1 to 0.4 mole of activator per mole of monomer unit.

3,881,923
ELECTROPHOTOGRAPHIC SENSITIVE PLATE

Susumu Tanaka, and Katsutoshi Konishi, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Japan

Continuation of Ser. No. 152,569, June 14, 1971, abandoned. This application June 12, 1973, Ser. No. 369,134

Claims priority, application Japan, June 15, 1970, 45-51335

Int. Cl. G03g *5/02*

U.S. Cl. 96—1.5 **5 Claims**

1. An electrophotographic sensitive plate for improving the fidelity of half-tone image reproduction, comprising:

a conductive substrate;

a first photoconductive selenium layer having a thickness of less than 1 micron deposited on said substrate for forming a rectifying barrier preventing the injection of charges from said substrate;

a second photoconductive layer formed on said first photoconductive layer in a reticulated pattern having a thickness no greater than 1 micron and comprising a mixture of selenium with an element selected from the group consisting of Te, As and Sb and containing between 10 and 30 percent of said element by weight;

a transparent organic semiconductor layer formed on said second photoconductive layer and comprising polyvinyl carbazole for maintaining electric charges on its surface and for transporting photo-charge carriers generated within said first and second photoconductive layers.

3,881,924
ORGANIC PHOTOCONDUCTIVE LAYER SENSITIZED WITH TRIMETHINE COMPOUND

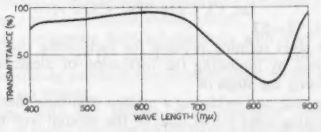
Yoshinobu Murakami, Katano, and Kazuhisa Morimoto, Settsu, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd.

Filed Aug. 23, 1972, Ser. No. 282,970

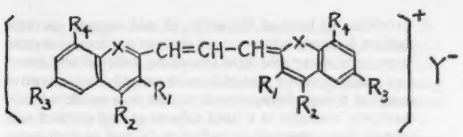
Claims priority, application Japan, Aug. 25, 1971, 46-65318; Oct. 4, 1971, 46-78075

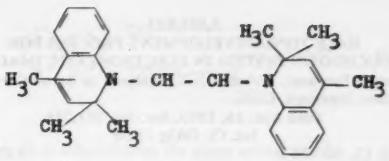
Int. Cl. G03g *5/06*

U.S. Cl. 96—1.6 **5 Claims**



1. An organic photoconductive layer comprising a combination of an organic photoconductor and a sensitizer having the following chemical formula.





wherein

R_1 is hydrogen or phenyl;

R_2 is hydrogen, phenyl, 4-methoxyphenyl, naphthyl, 2-methoxynaphthyl(1) or 4-methoxynaphthyl(1);

R_3 is hydrogen, methoxy, nitro or phenyl;

R_4 is hydrogen or methoxy;

X is oxygen or sulfur atom;

and Y^- is a perchlorate radical, said combination comprising 100 weight parts of an organic photoconductor and 0.01 to 5.0 weight parts of a sensitizer.

3,881,925

BI-CHARGEABLE ELECTROPHOTOGRAPHIC MATERIALS INCLUDING ZINC OXIDE AND A BINDER RESIN

Koji Uchida; Shigeyoshi Suzuki, and Sadao Kuriu, all of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed July 17, 1973, Ser. No. 380,027

Claims priority, application Japan, July 17, 1972, 47-71490

Int. Cl. G03g *5/08*

U.S. Cl. 96—1.8 **5 Claims**

1. A bi-chargeable electrophotographic photosensitive material containing photoconductive zinc oxide and a binder resin comprising a mixture of:

1. 50 to 90% by weight, based on the weight of said binder resin, of an acrylic copolymer comprising:
   a. 50 to 90% by weight of at least one lower alkyl acrylate,
   b. 1 to 5% by weight of at least one organic acid having a vinyl group copolymerizable with said at least one lower alkyl acrylate, and
   c. 0 to 49% by weight of at least one other compolymerizable vinyl monomer, and
2. 10 to 50% by weight, based on the weight of said binder resin, of a polystyrene having a molecular weight of less than 5,000.

3,881,926

SENSITIZED ELECTROPHOTOGRAPHIC LAYERS WITH A POLYMETHINE SENTIZING DYE

Hans Ohlschlager, Cologne; Oskar Riester, Leverkusen, both of Germany; Theofiel Hubert Ghys, Kontich; Karel Eugeen Verhille, Hoboken, and Johannes Josephus Vanheertum, Halle-Zand-Hoven, all of Belgium, assignors to Agfa-Gevaert Aktiengesellschaft, 509 Leverkusen-Bayerwerk, Germany

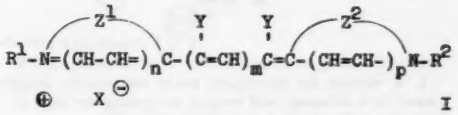
Filed Mar. 19, 1973, Ser. No. 342,872

Claims priority, application Germany, Mar. 23, 1972, 2214055

Int. Cl. G03g *5/08*

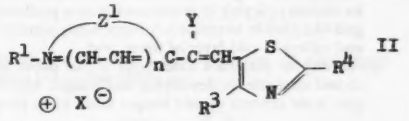
U.S. Cl. 96—1.6 **2 Claims**

1. An electrophotographic recording material having a layer support and at least one sensitized photoconductive layer containing a photoconductor, a sensitizing dye, wherein the improvement comprises a photoconductor selected from the group consisting of zinc oxide, 1-ethyl-3-phenyl-7-diethylamino-2-(1H)-quinoline, the photoconductor compound of the following formula:

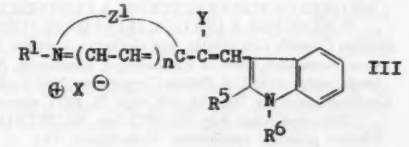


and in the photoconductor a sensitizing dye compound represented by one of the following formulae:

I



II



III

in which

Y is (1) a nitrile group, (2) a nitro group or (3) hydrogen; at least one of the groups Y having the meaning given as (1) or (2);

R^1, R^2 is a saturated or unsaturated aliphatic group which may be substituted with phenyl, hydroxyl, halogen, carboxyl, esterified carboxyl, carbamoyl, sulfonic acid or esterified sulfonic acid;

R^3 is hydrogen, a saturated or unsaturated aliphatic group or aryl;

R^4 is $—SR^7$ or NR^8R^9;

R^5 is a phenyl group which may be substituted with alkyl, aryl, alkoxy or halogen;

R^6 is a saturated or unsaturated aliphatic group;

R^7, R^8, R^9 is a saturated or unsaturated aliphatic group or an aryl group or R^8 and R^9 together denote the members required for completing a heterocyclic group containing a 5-membered or 6-membered heterocyclic ring;

n, *p* are 0 or 1;

m is 0, 1, 2 or 3;

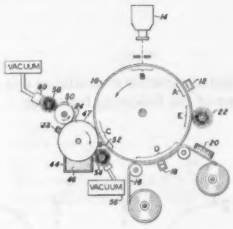
X^- is any anion;

Z^1, Z^2 are the ring members required to complete a 5- or 6-membered heterocyclic ring, which heterocyclic ring may contain a condensed benzene or naphthalene ring or other substituents.

3,881,927
HALF TONE DEVELOPMENT PROCESS FOR TOUCHDOWN SYSTEM IN ELECTROSTATIC IMAGING

Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 16, 1973, Ser. No. 351,221
Int. Cl. G03g *13/08*
U.S. Cl. 96—15 D 3 Claims



1. A method for developing latent electrostatic images carried by a substrate; said method comprising the steps of

loading a donor member with a layer of toner,

imparting a uniform electrical charge of predetermined polarity to said donor layer,

subjecting the charged toner to an electrostatic field having an intensity varying in accordance with a predetermined grid-like pattern to create a corresponding pattern of hills and valleys in said layer of toner, and

presenting the patterned toner layer of said doner member to said substrate for developing said images, whereby any gray scale content of said images tends to be preserved.

3,881,928
METHOD OF MANUFACTURING A LUMINESCENT SCREEN FOR A COLOUR TELEVISION TUBE

Jacobus Cornelis Gravesteijn, and Gerardus Antonius Wilhelmus Vermeulen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 184,268, Sept. 27, 1971, abandoned.
This application July 20, 1973, Ser. No. 381,014
Claims priority, application Netherlands, Oct. 2, 1970, 7014481
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.1 7 Claims

1. A method of producing a cathode ray tube color luminescent screen including a transparent support element and discrete color luminescing areas that are responsive to electron excitation and are separated by light absorbing material, said method comprising the steps of:

a. providing on a surface of said support element a first layer comprising filter material and a first photosensitive material, said filter material being characterized as being substantially permeable to a first wave length radiation range and substantially impermeable to a second wave length radiation range, said filter material being further characterized as being substantially insoluble in a first solvent and substantially soluble in a second solvent, said photosensitive material being characterized in that it is rendered substantially insoluble in said first solvent at certain portions of said first layer exposed to radiation in said first wave length range and is substantially soluble in said first solvent at other portions of said first layer unexposed to said first wave length radiation range,

b. selectively exposing said first layer to radiation in said first wave length range so as to render said certain portions of said first layer insoluble in said first solvent;

c. removing with said first solvent the unexposed said other portions of said first layer so as to provide said support element partially covered by said certain portions containing said filter material;

d. providing at least at the areas of said support element surface located between said certain portions a second layer comprising said light absorbing material and a second photosensitive material, said second photosensitive material being characterized in that it is rendered substantially insoluble in a third solvent at first parts of said second layer exposed to radiation in said second wave length range and is substantially soluble in said third solvent at second parts of said second layer unexposed to said radiation in said second wave length range;

e. exposing said second layer to said radiation in said second wave length range passed through said support element;

f. removing with said third solvent said unexposed second parts of second layer and the light absorbing material contained in said second parts;

g. removing said filtering material with said second solvent; and

h. providing said luminescing areas at portions of said support element surface located between said first parts of said second layer.

3,881,929
STABILIZING A PHOTOSENSITIVE COMPOSITION CONTAINING AN N-VINYL HETEROCYCLIC COMPOUND AND AN ORGANIC HALOGEN COMPOUND WITH AN AZABICYCLOENE COMPOUND

Shirow Asakawa, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 29, 1973, Ser. No. 364,315
Claims priority, application Japan, May 31, 1972, 47-54670
Int. Cl. G03c *5/24*
U.S. Cl. 96—48 R 7 Claims

1. A process of stabilizing image and background areas produced by exposure to light of a photosensitive composition containing an N-vinyl heterocyclic compound and an organic halogen compound, the process comprising the steps of:

wetting the image and background areas with an aqueous solution of 0.5 to 20% weight of an azabicycloene compound of a cyclic amidine represented by the formula

where *m* and *n* are each an integer ranging from 2 to 6; and drying the wet image and background areas at a temperature ranging from room temperature to 50°C.

3,881,930
2H-BENZIMIDAZOLE PHOTOREDUCTIVE IMAGING

William R. Schleigh, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,374
Int. Cl. G03c *5/24*, *1/72*, *1/52*
U.S. Cl. 96—48 R 26 Claims

1. In a photographic element having a support and coated thereon at least one radiation-sensitive image-recording layer comprised of a source of labile hydrogen atoms, an image-recordng means for registering an absorption change upon reduction by a photoreductant, said means being selected from the group consisting of aminotriarylmethane dyes, azo dyes, xanthene dyes, triazine dyes, nitroso dye complexes, indigo dyes, phthalocyanine dyes, tetrazolium salts, and triazolium salts; and a photoreductant in intimate association with said image-recording means, said photoreductant being capable of forming a reducing agent in the presence of said hydrogen atoms; the improvement in which said photoreductant is a 2H-benzimidazole.

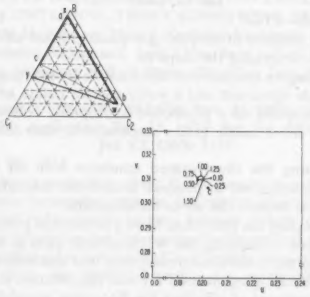
22. An image-recording process comprising
converting a 2H-benzimidazole within a selected areal portion of a radiation-sensitive layer of a photographic element to a dihydrobenzimidazole by imagewise exposing the 2H-benzimidazole to actinic radiation in the presence of labile hydrogen atoms,
reducing an image-recording compound capable of changing its radiation-absorption characteristic upon reduction with the dihydrobenzimidazole generated within the selected areal portions of the layer, said compound being selected from the group consisting of aminotriarylmethane dyes, azo dyes, xanthene dyes, triazine dyes, nitroso dye complexes, indigo dyes, phthalocyanine dyes, tetrazolium salts, and triazolium salts; and
heating the layer to convert residual 2H-benzimidazole not exposed to actinic radiation to 1H-benzimidazole.

3,881,931

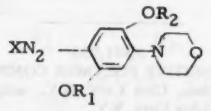
METHOD FOR DEVELOPING BLACK DIAZOTYPE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Motohiko Tsubota; Taiichi Nishimura, and Kinji Ohkubo, all of Minami Ashigara, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Kanagawa, Japan

Filed May 22, 1973, Ser. No. 362,722
Claims priority, application Japan, May 22, 1972, 47-50539
Int. Cl. G03c *1/58, 5/34, 1/54*
U.S. Cl. 96—49 **41 Claims**

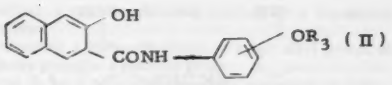


1. A method for developing a diazo-type photographic light-sensitive material to form a neutral black image substantially showing no dichroism wherein said material contains a coating on a support of at least one light-sensitive diazonium compound designated Component A selected from the compounds represented by the general formula:



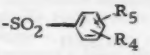
(I)

wherein R_1 and R_2 each represents an alkyl group having 1–6 carbon atoms or a cycloalkyl group having 5–6 carbon atoms, and X represents an anion, which method comprises imagewise exposing the light-sensitive material and then developing the light-sensitive material in an alkaline environment to form a dye image in the unexposed areas in the presence of at least one compound selected from the compounds represented by the general formula:

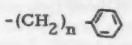


(II)

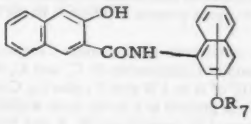
wherein R_3 is selected from the group consisting of



R_4 and R_5 each representing a hydrogen atom, a halogen atom or an alkyl group having 1–4 carbon atoms, $—COR_6$ wherein R_6 represents an alkyl group having 1–4 carbon atoms or a substituted or unsubstituted phenyl group and

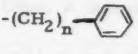


wherein *n* represents 1 or 2
or from the compounds represented by the general formula:

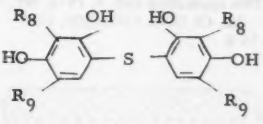


(III)

wherein R_7 represents a hydrogen atom, an alkyl group having 1–4 carbon atoms or

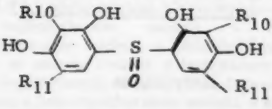


wherein *n* represents 1 or 2, as a coupler designated Component B capable of coupling with said light-sensitive diazonium compound Component A to form a blue dye;
and, as a coupler designated Component C_1 capable of forming a yellow dye, at least one compound selected from the compounds represented by the general formula:



(IV)

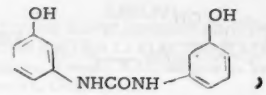
or



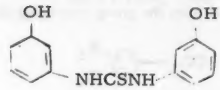
(V)

wherein R_8 and R_{10} each represents an alkyl group having 1–4 carbon atoms, and R_9 and R_{11} each represents a hydrogen atom or a halogen atom;
wherein the molar ratio of diazonium compound A to the total of coupler Components B and C_1 is about 10^{-2} to about 10^2 of A to 1 of B plus C_1; the molar ratio of Component B: Component C_1 is 95.0 : 5.0 – 37.5:62.5 and the amount of Component A coated is at least 0.001m mol/m².

2. A method for developing a diazo-type photographic light-sensitive material as described in claim **1**, wherein at least one compound selected from the compounds:

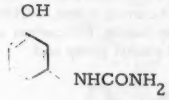


(VI)



(VII)

and



(VIII)

as a coupler designated Component C_2 capable of coupling with said light-sensitive diazonium compound Component A to form a yellow dye is present in addition to the Components B and C_1,

wherein the molar ratio of diazonium Compound A to the total of coupler Components B, C_1 and C_2 is about 10^{-2} to about 10^2 of A to 1 B plus C_1 plus C_2; Components B, C_1 and C_2 are present in a molar ratio within the triangular area formed by coordinants W, X and Y of the triangular diagram of FIG. 1 of the drawing, the molar ratios of B: C_1: C_2 at each point W, X and Y being for W 12.5: 5.0: 82.5, for X 95.0: 5.0: 0.0 and for Y 37.5: 62.5:0.0, and the amount of Compound A coated is at least 0.001m mol/m².

3,881,932

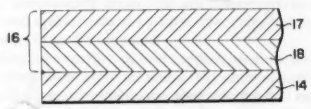
PHOTOGRAPHIC PRODUCTS WITH STRIPPABLE OPAQUE LAYERS

Richard W. Young, Wellesley Hills, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 239,582, March 20, 1972, abandoned. This application Oct. 3, 1973, Ser. No. 403,037

Int. Cl. G03c *1/48, 1/90, 1/84*

U.S. Cl. 96—76 R **17 Claims**



0000/000/008

1. A photosensitive element which comprises a photosensitive silver halide layer coated on a pellucid plastomeric layer and an opaque plastomeric sheet material having an optical density of at least about 6.0 adhered to said plastomeric layer on the said opposite said silver halide layer, said sheet material comprising a substantially water-insoluble fluid swellable polymeric material adapted to lose adhesive capability upon swelling, thereby separating from said pellucid layer.

3,881,933

LIGHT-SENSITIVE MATERIAL UNDERGOING LITTLE CHANGE OF LATENT IMAGE FORMED THEREIN

Akira Kumai; Keisuke Shiba, and Nobuo Yamamoto, all of Minami Ashigara, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Kanagawa, Japan

Continuation of Ser. No. 254,720, May 18, 1972. This application Sept. 17, 1973, Ser. No. 397,490

Claims priority, application Japan, May 18, 1971, 46-33429

Int. Cl. G03c *1/30, 1/14*

U.S. Cl. 96—111 **11 Claims**

1. A method for preventing fading of a latent image in an exposed gelatino-silver halide photographic emulsion which comprises adding to said photograhic emulsion (1) at least one of a monomethine or a trimethine cyanine dye having a cathode polarographic half wave potential ranging from −0.9 and −1.8 volt and an anode polarographic half wave potential lower than 1.3 volt and capable of forming J-aggregate, and (2) an organic compound which causes bridging to effect a hardening action by reation with gelatin and, at the same time, reacts with gelatin releasing an organic or an inorganic acid.

3,881,934

REMOVAL OF DISSOLVED PRODUCTS FROM A PRECIPITATE

Frans Henri Claes, Mortsel, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed June 4, 1971, Ser. No. 150,030

Claims priority, application United Kingdom, June 5, 1970, 27325/70

Int. Cl. G03c *1/02*

U.S. Cl. 96—114.7 **12 Claims**

1. In a method of preparing a photographic silver halide emulsion comprising the steps of:

1. forming an emulsion of silver halide by reacting a water-soluble silver salt and a water-soluble halide in an aqueous solution of a protective hydrophilic colloid to produce silver halide grains suspended in said colloid solution,
2. treating the thus formed emulsion with an inorganic flocculating salt to produce a curd-like flocculate of the colloid around the silver halide grains,
3. separating the flocculate from a substantial portion of the solution containing the water-soluble salts present after the initial emulsion-forming step and the dehydrating or precipitating agent used for said flocculation step,

the improvement of effecting the flocculate separation by:

a. introducing at least one stream of said flocculate-containing solution under pressure into a zone defined by a wall having the shape of a body of revolution, each such stream being introduced through a generally tangentially extending inlet port in said wall, wherein said solution is subjected to vortical flow in said zone,
b. withdrawing as a stream from said zone at a locus in the interior thereof spaced away from said wall a liquid fraction being substantially free of said flocculate, and
c. removing a stream of flocculate-containing solution from a locus adjacent said wall.

3,881,935

PHOTOSENSITIVE POLYMER COMPOSITION

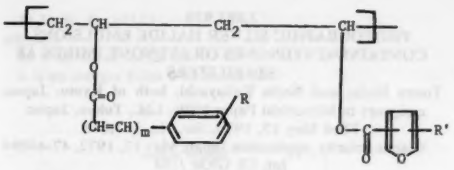
Joseph E. Apellaniz, Glen Cove, N.Y., assignor to Powers Chemco, Inc., Glen Cove, N.Y.

Division of Ser. No. 104,803, Jan. 7, 1971, Pat. No. 3,749,699. This application June 26, 1973, Ser. No. 373,617

Int. Cl. G03c *1/68, 5/00*

U.S. Cl. 96—115 R **5 Claims**

1. A composition consisting essentially of a light-sensitive organic solvent-soluble film-forming polymer capable of forming a continuous coating on a base which comprises recurring units of benzoate- and furoate-esterified polyvinyl alcohol having the structure:



wherein R and R′ are each H, alkyl or alkenyl of up to 12 carbon atoms, aryl, alkaryl or aralkyl of from 6 to 9 carbon atoms, halogen (F, Cl, Br, I), nitro, cyano, hydroxy, acetylamino amino alkoxy, carboalkoxy, alkylthio mono- or di-alkylamino, n-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfonyl, said alkyl groups containing from 1 to 4 carbon atoms, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, methoxymethyl, carbamyl, alkanoyloxy containing up to 4 carbon atoms, phenyl, p-chlorophenyl, p-methylphenyl or p-aminophenyl; *m* is a whole number from 0 to 1; said polyvinyl alcohol having a molecular weight of from 14,000 to 115,000 and esterified to the extent of from 60 to 100 percent, from 10 to 58 percent thereof comprised of benzoate moiety and a sensitizer therefor.

3,881,936

SILVER HALIDE PHOTOGRAPHIC EMULSION CONTAINING THREE SENSITIZING DYES

Yoshihide Hayakawa; Masaji Yoshida; Yoshiyuki Nakazawa; Yashuharu Nakamura, and Akira Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

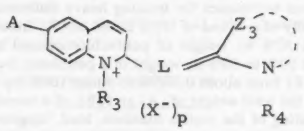
Continuation of Ser. No. 202,556, Nov. 26, 1971, abandoned. This application Jan. 23, 1974, Ser. No. 435,816

Int. Cl. G03c 1/14

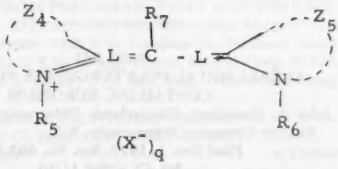
U.S. Cl. 96—216 **6 Claims**

1. A black-and-white silver halide emulsion suitable for a three-color separation process, having the improved blue-to-green and red-to-green gamma balance, which contains at least one sensitizing dye represented by Formula II and at least one sensitizing dye represented by Formula III in combination with at least one apomerocyanine dye represented by the Formula I:

Formula (II):



Formula (III):



wherein

Z_3 represents the atoms necessary to form a benzothiazole nucleus, a naphthothiazole nucleus, a benzoselenazole nucleus, a naphthoselenazole nucleus or a 2-quinoline nucleus;

A represents a hydrogen atome, a lower alkyl group, an alkoxy group or a hydroxy group;

Z_4 and Z_5 each represent the atoms necessary to form a benzimidazole nucleus, benzoxazole nucleus, naphthoxazole nucleus, benzothiazole nucleus, naphthothiazole nucleus, benzoselenazole nucleus or naphthoselenazole nucleus, or Z_5 can represent the group of atoms necessary to form an indolenine nucleus when Z_4 represents a benzimidazole nucleus;

R_3, R_4, R_5 each represent a lower alkyl group or a substituted alkyl group; wherein the substituted alkyl group represented by R_3, R_4, R_5 and R_6 is selected from the group consisting of hydroxyalkyl, acetoxyalkyl, alkoxyalkyl, carboxyalkyl, alkoxycarbonylalkyl, sulfoalkyl, allyl and aralkyl

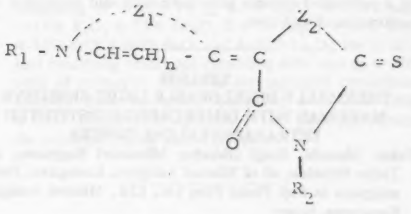
R_7 represents a lower alkyl group or an aralkyl group with the proviso that R_7 represents a hydrogen atom when at least one of Z_4 and Z_5 forms a benzimidazole nucleus;

L represents a methine group or may link to R_4, R_5 and R_6 by a polymethylene group;

p and *q* each represent 0 or 1 with the proviso that *p* and *q* are 0 when the dye forms an inner salt; and

X represents an acid anion,

Formula (I)



wherein:

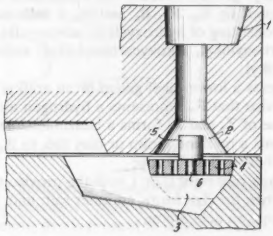
Z_1 represents the atoms necessary to form a heterocyclic nucleus selected from the group consisting of a thiazoline nucleus, a thiazole nucleus, a benzolthiazole nucleus, an alpha-naphthothiazole nucleus, a beta, beta-naphthothiazole nucleus, a beta-naphtholthiazole nucleus, an oxazole nucleus, a benzolxazole nucleus, an alpha-naphthoxazole nucleus, a beta, beta-naphthoxazole nucleus, a beta-naphthoxazole nucleus, a selenazole nucleus, benzoselenazole nucleus, a naphthoxazole nucleus, a selenazole nucleus, a benzoselenazole nucleus, a naphthoselenazole nucleus, a quinoline nucleus, a pyridine nucleus, a benzimidazole nucleus and a naphthoimidazole nucleus;

Z_2 represents an oxygen atom or a sulfur atom, R_1 and R_2 represent an alkyl group, a substituted alkyl group selected from the group consisting of a hydroxyalkyl group, an acetoxyalkyl group, an alkyloxyalkyl group, an allyl group, a carboxyalkyl group, a sulfoalkyl group and an aralkyl group, or an aryl group, and further wherein R_2 may be hydrogen atom, and *n* represents an integer of 0 or 1.

3,881,937
SHAPED INOCULATION MEANS FOR IRON CASTING MELTS

Konrad Teufel, Neunkirchen, Germany, assignor to Stettner & Co., Pegnitz, Germany

Filed Feb. 1, 1974, Ser. No. 438,651
Claims priority, application Germany, Feb. 27, 1973, 2309654
Int. Cl. C22c *37/02*; C21c *7/00*; C22b *9/12*
U.S. Cl. 75—130 R 4 Claims



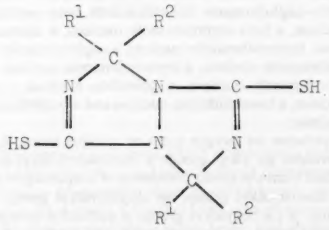
1. Shaped body inoculation means for introducing a silicide additive into an iron casting melt consisting of grains of said silicide embedded in a metal having a melting point lower than that of iron and shaped in a main body and peg-like projection means extending outward therefrom for positioning said body on a perforated strainer grate core with said projection in a perforation of said core.

3,881,938
THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL WITH DIMERCAPTO SUBSTITUTED TETRAZAPENTALENE TONERS

Takao Masuda; Kinji Ohkubo; Mitsunori Sugiyama, and Tadao Shishido, all of Minami Ashigara, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Kanagawa, Japan

Filed Apr. 26, 1973, Ser. No. 354,583
Claims priority, application Japan, Apr. 26, 1972, 47-41969
Int. Cl. G03c *1/10*, *7/00*, *1/02*
U.S. Cl. 96—96 12 Claims

1. A thermally developable light-sensitive material comprising a support having thereon a layer comprising: (1) silver salt of benzotriazole; (2) silver halide formed by reacting an inorganic halide with said silver salt of benzotriazole: (3) a compound selected from the group consisting of ascorbic acid, derivatives thereof and 3-pyrazolidone derivatives, as a reducing agent; (4) a binder; and (5) one or more compounds represented by the general formula:



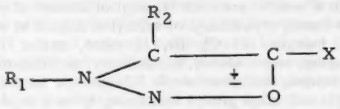
wherein R^1 and R^2 each represents hydrogen, an alkyl group a halogen substituted phenyl group or a phenyl group.

3,881,939
PHOTOGRAPHIC SILVER HALIDE EMULSIONS CONTAINING SYDNONES OR SYDNONE IMINES AS STABILIZERS

Touru Noda, and Norio Kobayashi, both of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed May 17, 1973, Ser. No. 361,086
Claims priority, application Japan, May 17, 1972, 47-48094
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 2 Claims

1. A photographic silver halide emulsion containing in an amount of 0.1 to 2 g. per mol of the silver halide in the emulsion at least one compound represented by the formula



wherein R_1 represents a hydrogen atom, an allyl group, a heterocyclic ring, an unsubstituted alkyl group or an alkyl group substituted with a halogen atom or a alkylamino group, an unsubstituted aryl group or an aryl group substituted with an alkyl or an alkoxy, or an unsubstituted aralkyl group or an aralkyl group substituted with an alkoxy group; R_2 represents a hydrogen atom, a halogen atom, an amino group, a carboxyl group, a formyl group, a nitro group, an acetyl group, an unsubstituted carbamoyl group or a carbamoyl substituted with a cycloalkyl or a phenyl group, a lower alkyl group or a lower alkyl group substituted with a phenyl or a hydroxyl group, or an unsubstituted phenyl group or a phenyl group substituted with a halogen atom or a nitro group and X represents an oxygen atom, or an unsubstituted imino group or an imino group substituted with an acyl, a carboxyl or a carbamoyl group; and the sign ± represents a resonance structure.

3,881,940
COMPOSITION FOR TREATING WOOD

Joseph Amundsen; William H. Wetzel, both of Federal Way; Norman Naimy, Seattle, and Robert J. Goodwin, Puyallup, all of Wash., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Division of Ser. No. 244,877, April 17, 1972, abandoned. This application July 12, 1973, Ser. No. 378,583
Int. Cl. C09d *5/14*
U.S. Cl. 106—15 AF 3 Claims

1. The wood preservative composition useful in pressure vacuum techniques for treating heavy timbers consisting essentially of a blend of (I) a blend of (A) from about 1% to about 50% by weight of pentachlorophenol and (B) from about 99% to 50% by weight of a petroleum hydrocarbon oil and (II) from about 0.005% to about 100% by weight, based upon the total weight of (A) and (B), of a member of a group consisting of the metals titanium, lead, tungsten, iron, chromium, tin, silver and cobalt and the oxides thereof added to prevent accumulation of sludge.

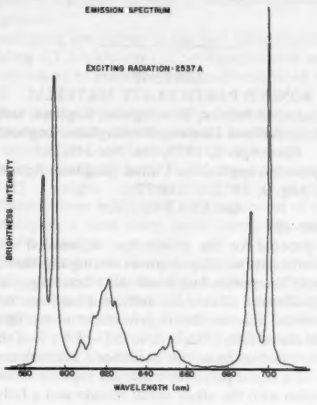
3,881,941
ALKALI METAL POLYTUNGSTATE PHOSPHORS CONTAINING EUROPIUM

John A. Kernohan, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,158
Int. Cl. C09d *11/10*
U.S. Cl. 106—20 8 Claims

1. Use of an alkali metal polytungstate phosphor as a photodetection means comprising water-soluble crystals essentially according to the general formula:

$M_7EuW_{10}O_{35}{\cdot}xH_2O$
wherein
M is an alkali metal ion
x is an integer from **0** to about **24**



to exhibit phosphorescence when excited by 2537A. radiation characterized by continuous emission in the orange-red region of the visible spectrum, which use comprises exposing an object marked with said phosphor to said excitation radiation.
5. A phosphorescent marking ink which comprises a liquid dispersion of the phosphor in claim **1.**

3,881,942

FAST DRYING, SOLVENT-FREE PRINTING INK

Geoffrey R. Buckwalter, Cincinnati, Ohio, assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 211,754, Dec. 23, 1971, Pat. No. 3,804,640. This application Oct. 1, 1973, Ser. No. 402,418
Int. Cl. C09d *11/02*
U.S. Cl. 106—22 **3 Claims**

1. In a fast drying, solvent-free printing ink containing 5–45 weight percent of pigment and a printing ink vehicle comprising a film-forming resin; the improvement comprising, as vehicle components,
an ester of an aliphatic alcohol and a C_{12} to C_{20} unsaturated fatty acid
and
a metal salt of peroxydiphosphoric acid.

3,881,943

COMPOSITION FOR INHIBITING LEAKAGE OF AIR PRESSURE FROM PNEUMATIC TIRES AND THE LIKE

John C. Fuller, 5221 S.E. Naef Rd., Milwaukie, Oreg. 97222; Gordon W. Fuller, 7320 S.W. Landeau St., Portland; Ralph A. Fuller, 12220 S.W. Grant, Tigard, both of Oreg. 97223, and William I. Fuller, P.O. Box 123, Wilsonville, Oreg. 97070

Filed Sept. 13, 1973, Ser. No. 396,748
Int. Cl. B60c *5/14, 21/08;* **C09k** *3/10*
U.S. Cl. 106—33 **6 Claims**

1. A composition for inhibiting the leakage of air pressure from pneumatic tire assemblies and the like, comprising an aqueous solution consisting essentially of about 2% to about 25% by weight of at least one of the alkali metal salts of benzoic acid.

3,881,944

POROUS GLASS-CERAMIC BODIES FOR CATALYST SUPPORTS

George H. Beall; Donald E. Campbell, both of Big Flats; John F. MacDowell, Painted Post; David M. Miller, Elmira; Richard F. Reade, Corning; Hermann L. Rittler, Horseheads, and Harry J. Watkins, Ithaca, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 11, 1972, Ser. No. 313,992
Int. Cl. C03c *3/22, 3/30, 3/04*
U.S. Cl. 106—39.7 **1 Claim**

1. A glass-ceramic article having a use temperature of at least 1,200°C., a coefficient of thermal expansion (25°–900°C.) less than 40×10^{-7}/°C., and at least a surface portion of relatively uniform porosity with pore diameters ranging between about 0.1–40 micrometers to provide a surface area of about 1–100 meters²/gram, said glass-ceramic being selected from the group:
a. consisting essentially, by weight on the oxide basis, of 2.5–5% Li_2O, 2.5–8% BaO and/or MgO, 14–22% Al_2O_3, 60–75% SiO_2, and 3–8% RO_2, wherein RO_2 consists of 3–8% TiO_2 and 0–3% ZrO_2, and wherein the principal crystal phase is celsian and/or cordierite;
b. consisting essentially, by weight on the oxide basis, of 2–15% Li_2O, 12–36% Al_2O_3, 55–75% SiO_2, and 3–7% TiO_2, and wherein the principal crystal phase is beta-spodumene;
c. consisting essentially, by weight on the oxide basis, of 10–21% MgO, 24–38% Al_2O_3, 48–60% SiO_2, and 8–12% TiO_2, and wherein the principal crystal phase is cordierite; and
d. consisting essentially, by weight on the oxide basis, of 35–70% Al_2O_3, 10–64% SiO_2, at least one modifying oxide in the indicated proportion selected from the group consisting of 1–20% P_2O_5, 1–5% Li_2O, 4–10% Na_2O, 1–15% K_2O, 4–25% Rb_2O, 4–15% Cs_2O, 4–10% CaO, 4–10% SrO, 4–40% BaO, and 4–20% La_2O_3, the total of said modifying oxides not exceeding 40%, and up to 40% total of refractory oxides in the indicated proportions selected from the group consisting of 0–25% ZrO_2, 0–30% ThO_2, 0–20% MgO, and 0–10% BeO, and wherein the principal crystal phase is mullite.

3,881,945

GLASS FIBER OF HIGH MODULUS OF ELASTICITY AND PROCESS FOR MANUFACTURING IT

Felix J. Trojer; Grahame P. O'Connor, both of Grand-Lancy/Geneva, and Helmut Tannenberger, Geneva, all of Switzerland, assignors to Battelle Memorial Institute

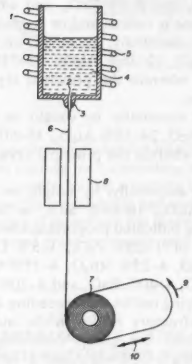
Filed Dec. 3, 1973, Ser. No. 420,883
Claims priority, application Switzerland, Dec. 4, 1972, 17638/72
Int. Cl. C03b *37/02;* **C03c** *3/22;* **C03b** *29/00*
U.S. Cl. 106—50 **2 Claims**

1. Process of manufacturing a glass fiber comprising:
forming a mixture of inorganic compounds in proportions corresponding to the composition of a glass having, above a temperature T_d which is included within the range of temperatures within which the viscosity of the glass has a value suitable for the drawing of fibers, a range of existence of a single vitreous phase which is decomposable, by cooling below T_d, into two vitreous phases, said decomposition manifesting itself by the formation of vitreous inclusions dispersed in a vitreous matrix, the composition of said glass being selected from a system comprising at least one range of existence of a crystalline phase capable of forming in said vitreous inclusions by heating within the temperature range below T_d,
melting said mixture and then bringing it to a temperature above T_d and maintaining it at such a temperature at least for a time sufficient to obtain its homogenization, then

maintaining it at a value, still greater than T_d, corresponding to that at which the viscosity is suitable for the drawing of fibers,

continuously stretching at least one fiber from the homogeneous mass thus obtained, regulating the temperature of this mass and the speed of drawing of the fiber in such a manner that the mass remains at a temperature above T_d and the temperature of the fiber is equal to T_d in the vicinity of the portion of the fiber where it originates from the mass,

passing the fiber thus produced into a first zone in which it is maintained, for a period of time sufficient to cause the formation of vitreous inclusions therein, at a temperature



below T_d but sufficient for the value of its viscosity to be suitable for a separation of phases in vitreous state,

then passing the fiber into a second zone in which its temperature assumes, by cooling over its entire cross section, a value close to room temperature,

then passing the fiber into a third zone in which the fiber is heated, in a portion of its thickness from its surface, to a value less than T_d but sufficient to cause the crystallization of the said crystalline phase, and maintaining the fiber in said third zone for a period of time sufficient to obtain a desired degree of crystallization, and

finally passing the fiber into a fourth zone in which its temperature resumes the value of room temperature.

3,881,946

PLATINUM-FREE GLASS

Robert J. Ginther, Temple Hills, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 228,293, Feb. 22, 1972, abandoned. This application May 30, 1973, Ser. No. 365,320

Int. Cl. C03c *3/04, 3/30*

U.S. Cl. 106—52 **1 Claim**

1. A glass composition consisting of the following ingredients in approximate molar percentages:

Ingredients	Mole Percent
SiO_2	79.6
Al_2O_3	3.2
Li_2O	3.4
Na_2O	10.3
MgO	1.2
CaO	2.3.

3,881,947

BONDED PARTICULATE MATERIAL

Graham Eastwood Palmer, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Apr. 2, 1973, Ser. No. 346,791

Claims priority, application United Kingdom, Apr. 4, 1972, 15443/72; Aug. 9, 1972, 37218/72

Int. Cl. C04b *35/16*

U.S. Cl. 106—84 **7 Claims**

1. In a process for the production of bonded refractory particulate material which comprises mixing together a major proportion of the particulate material, a bonding quantity of aqueous alkali metal silicate and sufficient hardener to harden the alkali metal silicate, the improvement comprising using sodium silicate of $SiO_2 : Na_2O$ ratio 2.2 – 3.5 : 1 as the alkali metal silicate and using as the hardener a mixture consisting essentially of a liquid polyhydric alcohol capable of forming a stable solution with the alkali metal silicate and a fully esterified ester of a polyhydric alcohol.

3,881,948

METHOD FOR REMOVING ORGANIC ACID SOIL FROM SURFACES

Daniel Schoenholz, Basking Ridge; Arthur W. Petersen, Florham Park, and Marcus Allen Northup, Jr., Morristown, all of N.J., assignors to Church & Dwight Co., Inc., New York, N.Y.

Filed July 20, 1973, Ser. No. 381,053. The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl. B08b *3/10*

U.S. Cl. 134—2 **10 Claims**

1. A method of removing soils containing free or combined organic acids comprising contacting the said soil with a weakly alkaline composition consisting essentially of at least one polyhydric alcohol compound having at least two free hydroxyl groups in which the numerical ratio of carbon atoms to hydroxy groups is not greater than 15, and 0.01 to 2 percent by weight of an alkaline acting catalyst capable of accelerating alcoholysis reactions, heating the soil and cleaning composition to at least 250° F to 550°F to form water soluble or water dispersible compounds, and then removing the residues remaining.

3,881,949

VAPOR DEGREASER PROCESS EMPLOYING TRICHLOROTRIFLUOROETHANE AND ETHANOL

Carl Martin Brock, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 27, 1973, Ser. No. 336,223

Int. Cl. B08b *5/00*

U.S. Cl. 134—31 **2 Claims**

1. In a method of cleaning articles in a vapor degreaser which is open to the atmosphere and comprises:

a. a boil sump containing a boil sump liquid;

b. at least one rinse sump which contains a rinse sump liquid and has an overflow means so that overflow rinse sump liquid gravitationally flows into the boil sump;

c. a means for condensing vapors of the boil sump liquid;

d. a means for diverting condensed vapors to the rinse sump; and

e. a vapor space between the condensing means and the boil and rinse sumps,

said boil and rinse sump liquid consisting essentially of 1,1,2-trichloro-1,2,2-trifluoroethane and ethanol and said method comprising:

a. boiling the boil sump liquid;

b. introducing articles to be cleaned into the degreaser and passing the articles through at least the vapor space of the degreaser;

c. condensing the vapors of the boil sump liquid;

d. adding 1,1,2-trichloro-1,2,2-trifluoroethane and ethanol as necessary to maintain the liquid volume of the system; and

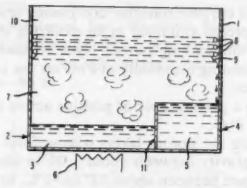
e. removing the articles from the degreaser,

the improvement whereby the vapors of the boil sump liquid are maintained in a nonflammable condition by:

a. employing a boil sump liquid consisting essentially of 35–85 weight percent of 1,1,2-trichloro-1,2,2-trifluoroethane and 15–65 weight percent of ethanol;

b. employing a rinse sump liquid consisting essentially of 88–100 weight percent of 1,1,2-trichloro-1,2,2-trifluoroethane and 0–12 weight percent of ethanol;

c. adding to maintain the liquid volume of the system a make-up liquid mixture consisting essentially of 90–97 weight percent of 1,1,2-trichloro-1,2,2-trifluoroethane and 3–10 weight percent of ethanol in such amount that the volume of the boil sump liquid is at least the volume calculated from the equation



$$\frac{v_l}{100}\,[(1.44\,c_b + 2.30\,c_r - 22.1)]$$

wherein

v_m = minimum permissible volume of boil sump liquid,

v_l = initial volume of boil sump liquid,

c_b = initial weight percent concentration of ethanol in the boil sump liquid, and

c_r = initial weight percent concentration of ethanol in the rinse sump liquid; and

d. maintaining the liquid volume in the rinse sump and condensate diverting means at least equal to the initial liquid volume in the boil sump.

3,881,950

MULTIPLE DRUM WASHING APPARATUS FOR VEHICLES

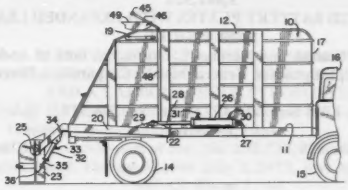
Bruce Harold Pettit, 210 S. Main St., La Rose, Ill. 61541

Filed Feb. 19, 1974, Ser. No. 443,332

Int. Cl. B08b *3/02, 9/08*

U.S. Cl. 134—115 R **7 Claims**

1. A drum washing apparatus for vehicles including a truck having an open top body for top loading of refuse therein defined by vertically disposed spaced side walls connected at the front by an end wall and having a floor, an upwardly open overhead trough extending between and mounted on said side walls at the top of the truck body adjacent the rear of the body, flushing apparatus on said trough including a plurality of nozzles directed upwardly at a rearward angle from the trough, lift mechanism at the rear of the truck body having a bucket for supporting a plurality of drums, said bucket being pivotally mounted in a pair of lift arms disposed at respectively opposite sides thereof, said lift arms being pivotally mounted at respectively opposite side walls of the truck body and having hydraulic mechanism for swinging said arms to raise and lower said bucket, a hydraulic cylinder on each lift arm connected to said bucket for pivoting the bucket in the lift arms,



said lift arms being movable to a position to dump the contents of said drums into said body and to a second position relative to said trough and flushing nozzles for washing the drums, said hydraulic cylinders pivoting said bucket to dump said drums in the first-named position and pivoting the bucket in said second position to align the drums with said angle of said flushing nozzles for drum washing, and means to retain said drums in said bucket.

3,881,951

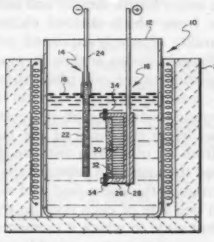
LITHIUM ELECTRODE AND METHOD OF PRODUCING THE SAME

Lowell R. McCoy, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 5, 1974, Ser. No. 485,852

Int. Cl. H01m *35/02*

U.S. Cl. 136—20 **15 Claims**



1. A lithium electrode comprising:

a foraminous metal substrate having an apparent density of from about 5 to 80 percent, a median pore size of from about 5 to 500 microns and a determined volumetric capacity; and

a mixture of (a) liquid lithium, and (b) a metal additive selected from the group consisting of copper, zinc and mixtures thereof disposed in the metal substrate, said mixture being present in an amount sufficient to fill at least 20 percent of the volumetric capacity of the metal substrate, and said metal additive comprising from at least 10 wt. percent up to about 45 wt. percent of said mixture.

8. A method of forming a lithium electrode comprising:

providing a foraminous metal substrate having an apparent density of from about 5 to 80 percent, a median pore size of from about 5 to 500 microns and a determined volumetric capacity,

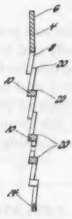
contacting the foraminous metal substrate with liquid lithium in the presence of a metal additive selected from the group consisting of copper, zinc and mixtures thereof, and

filling at least 20 percent of the volumetric capacity of the foraminous substrate with a mixture of said liquid lithium and metal additive, said metal additive being provided in an amount sufficient to comprise from at least 10 wt. percent up to about 45 wt. percent of the mixture.

3,881,952
LEAD-ACID BATTERY PLATES WITH EXPANDED LEAD SHEET GRIDS

Ellis G. Wheadon, and Norman L. Willmann, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 20, 1973, Ser. No. 398,975
Int. Cl. H01m *35/04*
U.S. Cl. 136—26 **3 Claims**



1. A lead-acid storage battery plate of the Faure-type comprising:

a paste-supporting skeleton of lead material defining a flat, top current-collecting header of sheet lead having a predetermined thickness and an upstanding connector lug, a reticulated portion depending from the header over substantially the entire length thereof and including a plurality of nodes from which skeletal elements project to define a plurality of nearly equiaxed polygonal, paste-retaining cells, said nodes angling from one face of the reticulated portion to the other face thereof and having a polygonal cross-section in the vertical transverse plane with two opposing sides of each polygon in planes substantially parallel to the faces of the pasted plate and spaced one from the other by a distance greater than said predetermined thickness but substantially less than twice said predetermined thickness, and said skeletal elements angling from one side of each node to the opposite side of the adjacent node to which it connects; and

a leady active material paste embedding the reticulated portion of the skeleton and together therewith defining a substantially flat plate having substantially parallel faces and a thickness at least equal to the distance between said opposing sides of said nodes whereby the skeletal elements angle through and are substantially covered by the paste and support the same over substantially the entire thickness thereof without substantially interrupting continuity of the paste from one polygonal paste-retaining cell to the next.

3,881,953
BATTERY ELECTRODE GRIDS AND METHOD OF MAKING SAME FROM A LEAD-CALCIUM-LITHIUM-TIN ALLOY

Lawrence Edward Turowski, New Kensington, Pa., assignor to St. Joe Minerals Corporation, New York, N.Y.

Filed Nov. 26, 1973, Ser. No. 418,947
Int. Cl. H01m *35/02*
U.S. Cl. 136—26 **3 Claims**

1. In a lead-acid battery cell, an electrode grid composed of an alloy of about 0.05 to 0.70 percent lithium by weight, calcium in the range of about 0.005 to 0.15 percent by weight, tin in the range of about 0.1 to 2 percent by weight, and the balance lead.

3,881,954
METHOD OF PRODUCING A LEAD DIOXIDE BATTERY PLATE

Nicholas J. Maskalick, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 18, 1974, Ser. No. 452,295
Int. Cl. H01m *39/00*
U.S. Cl. 136—27 **10 Claims**

1. A method of making a lead dioxide battery plate comprising the steps of:

A. heating a current collector comprising lead and up to 3 weight percent antimony in an oxidizing atmosphere, to form an interlocking porous layer at least about ¼ mil thick consisting essentially of PbO on the current collector surface;

B. applying a porous layer of positive active material paste onto the PbO;

C. contacting the porous layers with sulfuric acid having a specific gravity between about 1.05 to about 1.15, at a temperature between about 15° to 35°C, to penetrate the porous layers and to sulfate the PbO and active material layers, forming a homogeneous intermediate active material mass comprising tetrabasic lead sulfate interlocking with the current collector;

D. anodizing the current collector with the interlocked intermediate active material mass in sulfuric acid having a specific gravity between about 1.05 to about 1.15, at a temperature between about 15° to 35°C, to produce a porous, homogeneous final active material mass comprising lead dioxide firmly interlocked to the current collector.

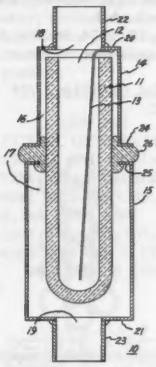
3,881,955
WALL-SEALED BATTERY CASING AND SEALED PRIMARY SODIUM-HALOGEN BATTERY

Robert R. Dubin; William L. Mowrey, and William A. Gilhooley, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 239,890, March 31, 1972. This application May 28, 1974, Ser. No. 474,036
Int. Cl. H01m *21/00*
U.S. Cl. 136—83 R **1 Claim**

1. A wall-sealed battery casing comprises an open ended inner vessel of a solid crystalline ionconductive material, an electronic conductor within the interior of the inner vessel and extending outwardly through the open end of the vessel, two outer opposed open ended metallic vessel portions each with an additional opening surrounding the inner vessel, each outer vessel portion has an oppositely extending flange at its open end, and a sodium and halogen resistant glass seals the adjacent flanges together and seals the outer vessel portions to the outer vessel portions to the outer wall of the inner vessel, a fill

tube affixed to each additional opening, the electronic conductor affixed to the associated outer metallic vessel portion,



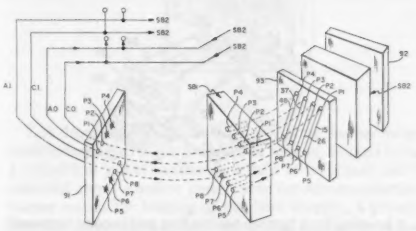
and the two outer metallic vessel portions sealed together and to the outer wall of the inner vessel.

3,881,956

FUEL CELL CONSTRUCTION

Thomas S. Williams, Newton, Mass., assignor to General Engineering Laboratories, Inc., Westford, Mass.

Filed July 28, 1972, Ser. No. 276,149
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 R **17 Claims**



1. In a parallel electrolyte feed, parallel electrolyte drain stacked array of fuel cells with a common electrolyte supply and common electrolyte drain electrically connected in series, the improvement comprising,

means defining a plate at an end of the stack with transverse conduits therein,

means forming a first imperforate electrolyte feed conduit running along a marginal edge of said stacked cells essentially parallel to the direction of stacking and interconnecting said common electrolyte supply with an end of a first one of said transverse passages to define therewith an elongated electrolyte feed passage bypassing the cells in said stack,

means defining a branched electrolyte feed channel running along a marginal edge of said stacked cells and having a feed end connected to an end of said first transverse conduit to define a branched passage receiving electrolyte from said first transverse conduit and supplying said electrolyte to said cells in parallel,

means forming a second imperforate electrolyte drain conduit running along a marginal edge of said stacked cells essentially parallel to the direction of stacking and interconnecting said common electrolyte drain with a second one of said transverse passages to define therewith an elongated electrolyte drain passage bypassing the cells in said stack,

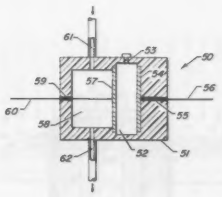
means defining a branched electrolyte drain channel running along a marginal edge of said stacked cells and having a drain end connected to an end of said second transverse conduit and draining electrolyte from said cells in parallel.

3,881,957

ELECTROCHEMICAL CELL COMPRISING A CATALYTIC ELECTRODE OF A REFRACTORY OXIDE AND A CARBONACEOUS PYROPOLYMER

Rudolf H. Hausler, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 235,772, March 17, 1972, abandoned. This application July 2, 1973, Ser. No. 375,984
Int. Cl. Ho1m *27/04*
U.S. Cl. 136—86 D **16 Claims**



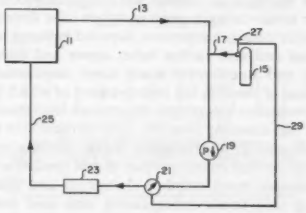
1. In an electrochemical cell, an electrode therefor comprising a refractory oxide having a surface area from 1 to 500 square meters per gram, and a carbonaceous pyropolymer forming at least a monolayer on said refractory oxide, said electrode having a conductivity at room temperature of from 10^{-8} to 10^{0} inverse ohm-centimeters.

3,881,958

MASS FLOW RATE CONTROL OF CHLORINE CONTENT OF ELECTROLYTE FOR HIGH ENERGY DENSITY BATTERY

Peter Carr, Utica, and Carmelo J. Amato, Livonia, both of Mich., assignors to Energy Development Associates, Madison Heights, Mich.

Filed July 2, 1973, Ser. No. 376,019
Int. Cl. H01m *27/12*
U.S. Cl. 136—86 B **11 Claims**



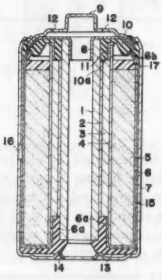
1. An improved method for controlling the addition of chlorine to an electric energy storage device of the metalchlorine type, having an electrode compartment with an inlet means and an outlet means wherein chlorine laden aqueous metal halide electrolyte is passed into the electrode compartment inlet and electrolyte having lower chlorine content than that passing into said inlet is passed out of the electrode compartment outlet while a pumping means circulates the electrolyte from said outlet to said inlet through a means for sensing the chlorine to aqueous electrolyte ratio, then comparing said

ratio to a desired ratio of chlorine to aqueous electrolyte wherein the improvement comprises sensing the chlorine to aqueous electrolyte ratio by measuring the mass flow rate of said circulating electrolyte and controlling the addition of chlorine to said circulating electrolyte in response to the sensed mass flow rate.

3,881,959
AIR CELL

Takashi Tsuchida, Kosai; Kenichi Shinoda, Toyohashi; Kohei Yamamoto, and Tomoya Murata, both of Kosai, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1973, Ser. No. 385,179
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 A **3 Claims**

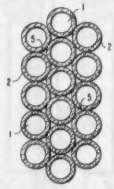


1. An air cell comprising an outer metal casing constituting an anode terminal of the cell, an anode inner casing containing anode active mass therein and electrically connected to said outer metal casing, a porous carbon tube disposed inside of said anode casing, a separator disposed between said anode active mass and said carbon tube, upper and lower sealing insulators, and a perforated metal cover constituting a cathode terminal of the cell, the improvement of which comprises an alkali-resistance electrolyte-impervious insulative synthetic resin thin film covering over the outer vertical side surface of said anode casing, a conductive metal member penetrated through the vertical center portion of said insulative thin film, said conductive metal member electrically and liquid-tightly connecting said anode inner casing with said outer metal casing, and an annular foamed plastic plate directly upon said anode active mass, said annular foamed plastic plate being pressed against said anode active mass by a marginal portion of said anode inner casing, said upper sealing insulator having a downward extension which abuts against an upper periphery of said porous carbon tube, said lower sealing insulator having an upward extension which abuts against a lower periphery of said porous carbon tube, wherein said cell contains an air space between a bottom end of said porous carbon tube and a bottom of said outer metal casing, and said outer metal casing has apertures which are in communication with said air space.

3,881,960
ELECTRODE FOR GALVANIC CELLS

Friedrich Haschka; Rolf Linkohr, both of Stuttgart, and Heinz G. Plust, Neuhausen, all of Germany, assignors to Deutsche Automobilgesellschaft mbH

Filed Feb. 19, 1974, Ser. No. 443,194
Claims priority, application Germany, Feb. 17, 1973, 2307851
Int. Cl. H01m *27/04*
U.S. Cl. 136—120 FC **17 Claims**

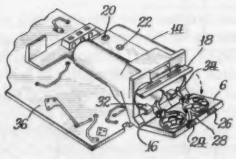


1. A hydrogen storage electrode comprising a body formed of particles of an active, hydrogen-storing material, said particles being enveloped by and in surface contact with $TiNi_3$ which is inactive with respect to the hydrogen storage but has a high hydrogen permeation.

3,881,961
BATTERY HOUSING

Melvin Stanley Nation, Twin Lakes, Wis., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 2, 1973, Ser. No. 385,118
Int. Cl. H01m *1/04*
U.S. Cl. 136—173 **10 Claims**



1. A housing for a battery having first and second terminals, said housing comprising:

a body portion having an opening defined therein for receiving the battery;

a door having an open and a closed position attached to said body portion by means of a hinge, said door being positioned for covering said opening for retaining the battery within said body portion placed in the closed position, and for allowing removal of the battery when placed in the open position;

first and second contacts, said first contact being mounted to said door and said second contact being mounted to said body portion and positioned to make an electrical contact with said first contact when the door is in the closed position;

first battery contact means for making electrical contact to the first terminal of the battery attached to said door and electrically connected to said first contact, said first battery contact means being positioned to make electrical contact to said battery when said door is closed;

second battery contact means mounted within said body portion for making electrical contact to the second terminal of said battery when the battery is received in said opening; and

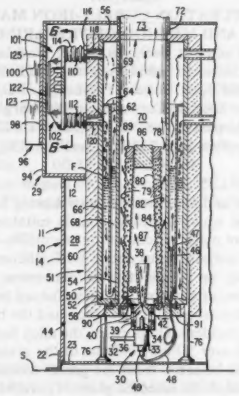
first and second output terminals mounted to said body portion in parallel spaced outwardly projecting relation-

ship and forming mounting means for securing said housing to a mounting board, said first output terminal being electrically connected to said second contact and said second output terminal being electrically connected to said second battery contact means, said first and second output terminals thereby providing electrical contact to said first and second battery terminals when said door is in the closed position.

3,881,962
THERMOELECTRIC GENERATOR INCLUDING CATALYTIC BURNER AND CYLINDRICAL JACKET CONTAINING HEAT EXCHANGE FLUID

Martin A. Rubinstein, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 167,212, July 29, 1971, abandoned. This application Feb. 6, 1973, Ser. No. 330,017
Int. Cl. H01v *1/00*
U.S. Cl. 136—209 **8 Claims**



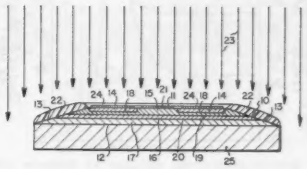
1. A thermoelectric generator comprising, burner means for combusting a fuel in the presence of oxygen, a boiler including a cylindrical jacket containing a fluid to be heated and being disposed about a hollow center area for accommodating said burner means for heating of the fluid thereby, a plurality of thermoelectric devices for converting thermal to electrical energy, a plurality of conduit means for channeling the heated fluid from said jacket into thermal proximity of said devices and returning said fluid to said jacket, and heat absorbing means disposed in thermal contact with said conduit means for conducting heat therefrom to said devices, said cylindrical jacket including an inner chamber extending about said center area for heating of said fluid within the inner chamber, an outer chamber extending about the inner chamber in communication therewith, said conduit means including a series of loops individual to the several thermoelectric devices and extending generally radially from said jacket, and said burner means including a catalytic reactor extending within said center area of said boiler and incorporating an outer reaction surface disposed to complete combustion in close proximity to said jacket.

4. A thermoelectric generator comprising, a generally cylindrical inner wall defining a combustion chamber, an outer wall surrounding said inner wall and forming with said inner wall an annulus surrounding said combustion chamber, said annulus having a closed lower end and containing a quantity of vaporizable heat transfer fluid therein, a plurality of pipes extending from the upper end of said annulus and arranged to conduct vapor of said heat transfer fluid upwardly from said annulus, a plurality of condensers, each in communication with a respective one of said pipes at the end thereof opposite said annulus, each of said condensers having a heat exchange surface to cause condensation of said vaporizable heat transfer fluid with said condensed fluid returning downwardly to said annulus via said pipes, a plurality of thermoelectric devices, each said thermoelectric device being in contact with a separate one of said condensers for receiving heat therefrom, a plurality of vent pipes extending from said condensers, and pressure relief means coupled to said vent pipes for relieving internal pressure when such pressure exceeds a predetermined level.

3,881,963
IRRADIATION FOR FAST SWITCHING THYRISTORS

Chang K. Chu; John Bartko, both of Pittsburgh, and Patrick E. Felice, Jeannette, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1973, Ser. No. 324,718
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **8 Claims**



1. A method of decreasing the turn-off time of thyristor without significantly effecting other electrical characteristics thereof comprising the steps of:

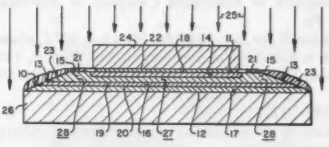
a. positioning a thyristor semiconductor body with a major surface thereof to be exposed to a radiation source; and

b. thereafter irradiating the thyristor semiconductor body with the radiation source to a dosage level corresponding to less than 2×10^{14} electrons/cm^2 with 2 Mev electron radiation.

3,881,964
ANNEALING TO CONTROL GATE SENSITIVITY OF GATED SEMICONDUCTOR DEVICES

Michael W. Cresswell, and Richard J. Fiedor, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 5, 1973, Ser. No. 337,967
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **9 Claims**



1. A method of decreasing gate sensitivity of a gated semiconductor device without significantly affecting other electrical characteristics of the device comprising the steps of:

a. masking conducting portions of a gated semiconductor device with a first given gate sensitivity against radiation from a radiation source;

b. thereafter decreasing the gate sensitivity to a second gate sensitivity value below a desired value by selectively

irradiating gating portions of the semiconductor device with the radiation source; and

c. thereafter increasing the gate sensitivity to a third desired gate sensitivity value below said first gate sensitivity value by annealing at least irradiated gating portions of the semiconductor device.

3,881,965

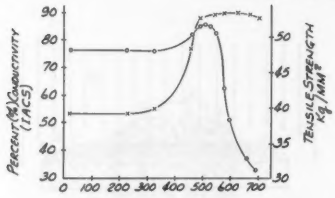
WIRE PRODUCT AND METHOD OF MANUFACTURE

Yoshio Matsuda, and Yoshio Maeda, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 879,102, Nov. 24, 1969, abandoned. This application Aug. 15, 1972, Ser. No. 280,813

Int. Cl. C22f *1/08*

U.S. Cl. 148—12.7 **2 Claims**



1. A method of manufacturing heat-resistant copper alloy of high ductility to provide for the production of electrical wire therefrom adaptable for electrical wiring and wire wrapping connections characterized by the steps of providing a four-element alloy consisting of 0.2 – 0.5 wt-percent cadmium, 0.03 – 0.2 wt-percent silver, 0.2 – 0.7 wt-percent chromium and the remainder copper wherein in producing the alloy, chromium, then silver, and then cadmium are added in the named order to the molten copper, subjecting the copper alloy to a solution heat treatment for 0.5 to 2 hours at a temperature of 900°C to 1000°C and thereafter rapidly cooling the alloy, cold working the copper alloy to provide a cold draft of 50 percent or more to draw the same into a fine wire, and thereafter age treating the wire for 0.5 to 2.5 hours at a temperature of 450°C to 550°C.

3,881,966

METHOD FOR MAKING ALUMINUM ALLOY PRODUCT

James T. Staley, Lower Burrell; Harold Y. Hunsicker, New Kensington, and Robert H. Brown, Natrona Heights, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 121,056, March 4, 1971, abandoned, which is a division of Ser. No. 60,343, Aug. 3, 1970, abandoned. This application June 14, 1973, Ser. No. 370,159

Int. Cl. C22f *1/04*

U.S. Cl. 148—12.7 **8 Claims**

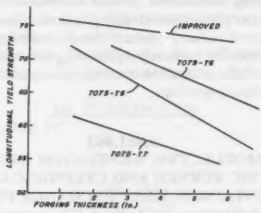
1. A method of producing an improved aluminum alloy product comprising

1. providing a body composed of an alloy consisting essentially of 4.5 to 8 percent Zn, 1.7 to 3.25 percent Cu, 1.4 to 2.6 percent Mg, the total of Zn + Cu + Mg being from 8.75 percent to 12.25 percent, Cu + Mg being 5.4 percent maximum with 0.2 Cu + Mg being 2 percent minimum, the Cu/Mg ratio being at least 0.85, and 0.05 to 0.25 percent Zr, chromium not to exceed 0.04 percent, the balance being aluminum and impurities and incidental elements,

2. working said body to produce said product,

3. solution heat treating said product,

4. quenching said product,



5. subjecting such product to an artificial aging treatment which includes an exposure at an elevated metal temperature to develop resistance to stress corrosion cracking.

3,881,967

HIGH SATURATION COBALT-IRON MAGNETIC ALLOYS AND METHOD OF PREPARING SAME

Alexander W. Cochardt, deceased, late of Washington, Ind.; by Hildegard Cochardt, administratrix, Bad Mergenstheim, Germany, and Karl Foster, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 228,320, Feb. 22, 1972. This application Jan. 2, 1974, Ser. No. 430,114

Int. Cl. C04b *35/00*

U.S. Cl. 148—31.55 **36 Claims**

1. A worked and heat treated alloy having a substantially flat surface and which alloy member is suitable for use as a transformer core material, consisting essentially of from about 4 to about 6% cobalt, up to about 1.5% silicon, up to about 0.3% aluminum, up to about 0.8% chromium, up to about 0.3% manganese, up to about 0.03% sulfur, up to about 0.05% nitrogen, less than about 0.03% carbon and the balance essentially iron with incidental impurities, the alloy having an orientation in which over 50% by volume of the grains have a unit cube orientation selected from the group consisting of (110) and (100) in which the selected plane is parallel to within 15° of the plane of the surface of the alloy and in which two of the cube edges of the selected plane are aligned parallel to within 15° of the working direction, the alloy also having a resistivity in excess of 30 microohm-centimeters.

3,881,968

INCENDIARY COMPRISING NAPHTHALENE AND MG-ETRAFLUOROETHYLENE

Willard F. Simpson, and John N. Sichra, both of China Lake, Calif. 93555

Filed June 22, 1973, Ser. No. 372,554

Int. Cl. F24j *1/04*; **F42b** *25/14*

U.S. Cl. 149—2 **4 Claims**

1. An article of manufacture fabricated by pressing a mixture consisting essentially of naphthalene and of magnesium-polytetrafluoroethylene powder into a suitable shape.

3,881,969

SOLID PROPELLANT WITH HYDROXY-TERMINATED BUTADIENE-FERROCENYL METHYL ACRYLATE COPOLYMER BINDER

Mart G. Baldwin, Newtown, Pa., and Samuel F. Reed, Jr., Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 25, 1969, Ser. No. 886,605

Int. Cl. C06d *5/06*

U.S. Cl. 149—19.2 **2 Claims**

1. A propellant composition comprised of a plasticizer, a metal additive, inorganic oxidizer, and the hydroxy-terminated copolymers of butadiene and ferrocenyl methyl

acrylate prepared by reacting ferrocenyl methyl acrylate and a suitable polymerization initiator in an inert organic solvent with butadiene at a reaction temperature and for a reaction time period sufficient for said reaction to take place after which solvent removal is effected and said copolymers are dried at a suitable drying temperature while under reduced pressure; said initiator being selected from azo-bis-(2-methyl-5-hydroxy-valeronitrile), azo-bis-(2-methyl-3-hydroxypropionitrile), and azo-bis-(hydroxyethyl-2-methyl propionate); said inert organic solvent being selected from toluene, dioxane, and dimethyl formamide; said reaction temperature being in the range of about 60°C to about 80°C; said reaction time being from about 24 hours to about 120 hours; said drying is accomplished at a suitable temperature in the range of about 70°C to about 75°C and said reduced pressure is in the range of about 1 millimeter; said copolymers being characterized by a molecular weight in the range from about 1000 to about 10,000, hydroxy-end group content of about 0.1 weight percent to about 2.5 weight percent, and an iron content of about 0.74 weight percent to about 12.0 weight percent.

3,881,970

EXPLOSIVE COMPOSITION HAVING A LIQUID HYDROXYALKYL NITRATE AS SENSITIZER

Errol Linton Falconer, Mont Saint-Hilaire, Quebec, and Harold William Holden, St. Hilaire, Quebec, both of Canada, assignors to Canadian Industries Limited, Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 305,337, Nov. 10, 1972, abandoned. This application Nov. 28, 1973, Ser. No. 419,678

Int. Cl. C06b *1/04*

U.S. Cl. 149—47 **7 Claims**

1. A substantially non-aqueous explosive composition having a water content of less than 3% by weight and having as a sensitizer at least one liquid hydroxyalkyl nitrate.

3,881,971

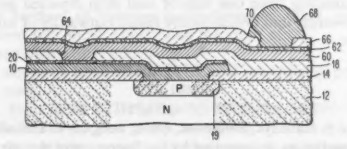
METHOD FOR FABRICATING ALUMINUM INTERCONNECTION METALLURGY SYSTEM FOR SILICON DEVICES

Stuart E. Greer, Poughkeepsie; Randolph H. Schnitzel, Newburgh, and David P. Waldman, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,318

Int. Cl. C23b *3/04*; C23f *1/02*

U.S. Cl. 156—11 **8 Claims**



1. A method of fabricating an improved aluminum metallurgy system of conductive stripes on a monocrystalline silicon semiconductor device that makes electrical contact with the body of the device through at least one opening in an insulating layer comprising:

forming a blanket layer of aluminum over said insulating layer which makes contact with the monocrystalline body of the silicon device through at least one of said openings, depositing a thin blanket layer of silicon over said layer of aluminum, the thickness of said layer of silicon being such that the ratio of the thickness of said aluminum layer to the thickness of said silicon layer is in the range of 50 to 1 to 120 to 1,

removing selected portions of said aluminum and silicon layers to define an interconnection metallurgy system,

forming a passivating layer of insulating material over said metallurgy system in direct contact with said layer of silicon, and

said semiconductor device capable of withstanding heating for prolonged periods at temperatures up to 577° C without undergoing significant aluminum penetration into the silicon body.

3,881,972

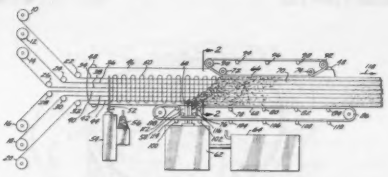
CONTINUOUS PROCESS AND MACHINE

Richard L. Long, Rowland Heights, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Oct. 2, 1973, Ser. No. 402,721

Int. Cl. B32b *5/18*, *31/14*

U.S. Cl. 156—79 **7 Claims**



1. The method of making three-dimensional fiber reinforced insulation comprising the steps of:

1. positioning several layers of reinforcing material in predetermined vertically stacked and spaced relationship with the layers being in substantially horizontal planes,
2. passing multiple rows of fibers vertically through said layers with loops under the lowermost layer and over the uppermost layer to form a three-dimensional matrix,
3. injecting a foamable insulation material into said matrix and allowing it to foam around and through said matrix, and
4. thereafter cure the resulting composite into a self-supporting structure suitable for adhering to a container.

3,881,973

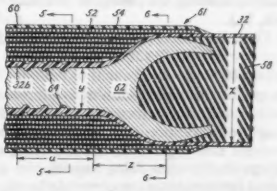
JOINT CONSTRUCTION AND METHOD OF FABRICATION

Robert L. Pinckney, Glen Mills, Pa., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 78,727, Oct. 7, 1970, Pat. No. 3,725,981. This application Dec. 7, 1972, Ser. No. 313,030

Int. Cl. B29c *27/00*

U.S. Cl. 156—86 **8 Claims**



1. A method of forming a structural joint comprising the steps of providing first and second members having an end-to-end relationship wherein the first member is a composite material having a first filamentary material extending therefrom and a second member wherein the first filamentary material overlaps the second member, heating an expansible second filamentary material to a temperature significant

enough to affect an expansion of the second filamentary material, winding the said second filamentary material in a transverse direction around the overlapped first filamentary material of the composite first member and second member, securing the second filamentary material so as to prevent the second filamentary material from unwinding, and allowing the second filamentary material to cool, thereby contracting to form a solid joint.

3,881,974

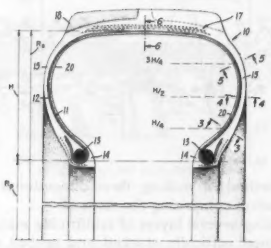
TIRE HAVING TWO-PLY CARCASS MERGING INTO ONE PLY

Yves Jacques de Zarauz, Gergovie, France, assignor to Compagnie Generale des Establissments Michelin, raison sociale Michelin & Cie, Clermont-Ferrand (Pug-de-Dome), France

Division of Ser. No. 247,780, April 26, 1972, Pat. No. 3,983,926. This application Sept. 4, 1973, Ser. No. 393,785

Int. Cl. B29h *17/26, 17/28*

U.S. Cl. 156—123 **4 Claims**



1. A method of manufacturing a tire with a desired shaping ratio τ by the building of a cylindrical blank and subsequent shaping of the blank, comprising the steps of forming at least one ply comprising two superimposed layers of cords having the same orientation and the same pitch e, for the purpose of constituting a carcass for the tire, the carcass when shaped including a pair of sidewalls, staggering the cords of each layer by half the pitch $e/2$ with respect to those of the other layer, the pitch e being between $4d/(\tau + 1)$ and $2d$, where d is the diameter of the cords, and then shaping the blank in accordance with the shaping ratio τ, so that, in the region of the carcass between the middle of the two sidewalls, successive cords of one layer are inserted, during and as a result of said shaping, between adjacent cords of the other layer, and the cords of both layers are substantially at the same distance from the inner wall of the tire.

3,881,975

POLYAMIDE HOSE AND PREPARATION THEREOF

Robert B. Koch, Reading, Pa., assignor to Rilsan Corporation, Glen Rock, N.J.

Filed Apr. 26, 1973, Ser. No. 354,301

Int. Cl. B32b *1/08, 1/10*

U.S. Cl. 156—149 **25 Claims**

1. A process for the preparation of a reinforced hose construction which comprises contacting a polyamide or copolyamide tubing with a solution of a solid organic compound in a volatile solvent said organic compound being crystalline at ambient temperatures and being capable of solvating the surface of said polyamide or copolyamide having a solubility of at least about 20% by weight in said volatile solvent and a melting point between about 40° and 180° C, said organic compound also having an acidic hydrogen atom and being selected from the group consisting of

1. a mono or poly functional carboxylic acid, said monoacid having up to eight carbon atoms and said poly functional acid having up to 12 carbon atoms, including halogenated derivatives thereof,
2. a mono or poly functional acidic hydroxyl-containing aromatic compound,
3. a non-carboxylic aromatic acid, and
4. mixtures of the aforesaid materials, including a mixture containing resorcinol, forming crystals of said organic compound on said tubing by drying said volatile solvent, reinforcing said tubing with at least one layer of a synthetic or natural fiber and then subjecting the reinforced tubing thus obtained to a temperature of at least about 150° F.

3,881,976

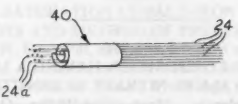
FIBER BUNDLES FOR ORNAMENTAL DISPLAY DEVICES AND METHOD OF MAKING SAME

James A. Jones, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 16, 1973, Ser. No. 333,439

Int. Cl. B32b *17/04;* **G02b** *5/16*

U.S. Cl. 156—180 **8 Claims**



1. The method of making an ornamental bouquet of flared light-conducting fibers comprising the steps of:

forming a ribbon of a plurality of juxtaposed light-conducting fibers;

securing said fibers together with a strip of material extended across said ribbon;

cutting across said ribbon through said juxtaposed fibers along two lines, one spaced away from each of respectively opposite sides of said strip, one of said lines being oblique to the longitudinal direction of said fibers at least throughout a substantial portion of its extension across said ribbon to produce fibers of progressively varying lengths according to the ornamentation desired of said bundle;

removing the section of said ribbon extending between said two lines of cutting;

rolling said section of ribbon from an edge adjacent the shortest of said varying lengths of fibers toward its opposite edge in a direction generally perpendicular to axial directions of the juxtaposed fibers to form at least some of said fibers into a bundle;

securing said bundle against unrolling; and

orienting said bundle generally vertically with said fibers extending from one side of said strip directed generally upwardly and ornamentally flared outwardly of said bundle.

3,881,977

TREATMENT OF GRAPHITE FIBERS

Richard J. Dauksys, Bellbrook, Ohio, assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

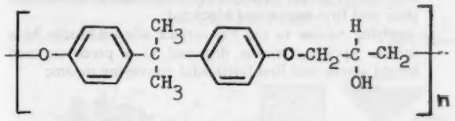
Filed Nov. 15, 1972, Ser. No. 306,648

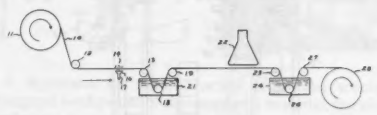
Int. Cl. B29g *3/00*

U.S. Cl. 156—242 **11 Claims**

7. A method for fabricating a composite reinforced with graphite yarn which comprises heating the yarn in **1000°**at a temperature in the range of 100° to 4500°F for a period ranging from about 0.10 to 12 seconds; passing the heated yarn through a solution of a thermoplastic polymer, thereby coating the yarn with the polymer; evaporating solvent from the coating on the graphite yarn; passing the coated yarn through a solution of a thermosetting resin; thereby coating the thermoplastic polymer coated yarn with thermosetting resin; evaporating solvent from the coated yarn; and molding portions of

the coated yarn under heat and pressure to form a composite. **10.** The method according to claim **9** in which the thermoplastic polymer is a polyhydroxy ether having the following structural formula:





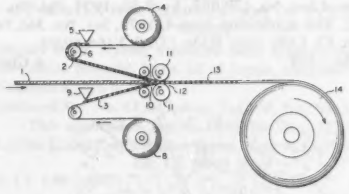
wherein *n* has a value such that the polymer has a molecular weight of about 35,000; the thermosetting resin is an epoxy resin; and stacked plies of the coated yarn are molded at a temperature in the range of about 175° to 450°F under a pressure of about 100 to 1000 psi for a period of about 1 to 8 hours.

3,881,978

METHOD OF FORMING A POLYESTER PREIMPREGNATED FIBERGLASS SHEET

Everett L. Livingston, Easley, and James M. Kring, Hampton, both of S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1974, Ser. No. 450,274
Int. Cl. B32b *31/00*
U.S. Cl. 156—247 **9 Claims**



1. A method of forming a non-flowable, filled, resinous, flame resistant sheet, comprising the steps of:

A. homogeneously admixing
1. about 30 to 50 weight percent of unsaturated polyester resin,
2. about 2 to 10 weight percent of reactive diluent, selected from the group consisting of styrene, methyl methacrylate, vinyl toluene, diallyl phthalate, vinyl acetate, cyclopentadiene and allyl maleate,
3. about 30 to 65 weight percent filler comprising alumina trihydrate, and
4. an effective amount of hardener, effective to catalyze the admixture only at temperatures above about 100°C; and then

B. adding to the admixture, about 0.2 to 5 weight percent of a thickener selected from the group consisting of calcium oxide, magnesium oxide and mixtures thereof, to provide a resinous composition having a viscosity between about 18,000 to 30,000 cps at 25°C; and then

C. immediately coating the composition at about room temperature onto at least one surface of a fibrous mat of substantially fixed fibers; and then

D. compacting the coated mat at about room temperature, to cause the composition to flow around the fibers of the mat and completely fill the mat; and then

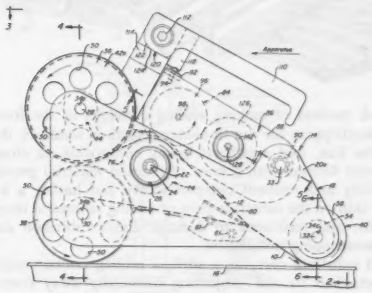
E. semi-curing the composition within the mat at about room temperature, by allowing the composition to thicken to a viscosity over about 10,000,000 cps at 25°C, said filled polyester composition having a weight ratio of resin composition to fiber of between about 3:1 to 1:1, to form a filled, resinous, flame resistant mat, containing a non-flowable, filled, polyester composition.

3,881,979

METHOD OF PRINTING AND DISPENSING LABELS

Calvin E. Kelly, Franklin Township Westmoreland, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 117,601, Feb. 22, 1971, Pat. No. 3,715,262. This application Sept. 14, 1972, Ser. No. 289,014
Int. Cl. B44c *1/00*
U.S. Cl. 156—249 **8 Claims**



1. A method of printing and dispensing pressure-sensitive adhesive labels maintained in spaced relation on a continuous label-bearing carrier strip and for applying said labels onto an elongated member, said method comprising the steps of:

a. storing the unused portion of said label-bearing carrier strip on a supply reel for subsequent advancement toward said elongated member, while storing the used portion of said carrier strip on a take-up reel commonly supported with said supply reel and which is rollably engageable with said elongated member;

b. passing the intermediate portion of said label-bearing carrier strip, lying between said supply reel and said take-up reel, through the nip of a back-up roll and a co-operating printing roll driven thereby, for frictionally engaging and rotating said back-up roll and thereby rotating said printing roll to successively print predetermined indicia on a label upon the advancement of said carrier strip; then

c. passing the intermediate portion of said carrier strip having indicia printed on said labels over one side of a peel-off member so that advancement of said carrier strip from said supply reel and onto said take-up reel successively separates the spaced labels from the carrier strip and advances each successive label away from the carrier strip and onto the elongated member;

d. moving said take-up reel and said elongated member relative to one another to rotate said take-up reel by an amount sufficient to print at least one intermediate label with indicia and to separate the leading label from said carrier strip by passage of the strip over said peel-off member and advance said leading label onto said elongated member; and

e. rolling said separated label against said elongated member by a roll movable with said take-up reel to secure said label to said member.

3,881,980

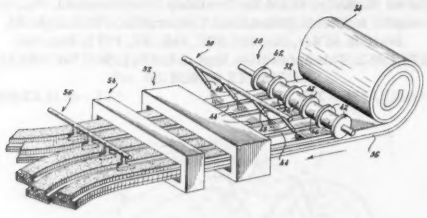
METHOD FOR MAKING WEATHERSTRIPPING HAVING A FOAM PLASTIC CORE, A TOUGH OUTER SKIN, AND A SEALING SURFACE COVERED WITH FLOCKED FIBERS OR THE LIKE

Harold G. Olson, Westport, Conn., assignor to H. G. Olson & Company, Incorporated, Amesbury, Mass.

Continuation-in-part of Ser. No. 186,237, Oct. 4, 1971, Pat. No. 3,758,992, which is a continuation-in-part of Ser. No. 44,977, June 10, 1970, abandoned. This application July 20, 1973, Ser. No. 380,945

Int. Cl. B32b *31/00*; B29c *17/14*

U.S. Cl. 156—268 **7 Claims**



1. A method of making sealing elements in the form of weatherstripping for use in closures such as windows, doors, and the like, said weatherstripping comprising an elongate substrate formed with a core of foamed material providing flexibility and resilient compressibility and having a tough outer skin on the substrate core providing structural integrity therefor and resistance to damage due to abrasion during weatherstripping installation;

said substrate carrying a surface sealing contact material attached to and projecting outwardly away from the substrate for engaging a surface to be sealed by effecting a desirably tight, water-and-air resistant joint at the closure, said method comprising the steps of:

supplying a sheet of plastic foam material with the bottom of said sheet having a relatively stiff backing layer laminated thereto to provide rigidity to the foam sheet;

forming the top of said sheet with a series of parallel grooves presenting intergroove lands defining substrate portions the top surfaces of which are at least approximately parallel to said sheet bottom;

applying to at least said top surfaces of said substrate portions and the side wall surfaces of said grooves a tough outer skin having substantially greater strength than said foam core;

attaching a surface sealing contact material to the top surfaces of said substrate portions to project outwardly away therefrom to effect sealing contact with the surface to be sealed; and

dividing said foam plastic sheet along said parallel grooves so as to form individual parallel strips including said substrate portions and defining a plurality of sealing elements for use as weatherstripping.

3,881,981

DEVICE AND METHOD FOR PREFABRICATING WALL PANELS FROM BLOCK-LIKE ARTICLES

Hans Lingl, Fasanenweg 14, 7910 Neu-Ulm, Ludwigsfeld, Germany

Division of Ser. No. 186,628, Oct. 5, 1971, Pat. No. 3,790,428. This application Nov. 7, 1973, Ser. No. 413,459

Claims priority, application Germany, Oct. 6, 1970, 2048944; Jan. 19, 1971, 2102291; June 11, 1971, 2129010

Int. Cl. B32b *31/00*; E04b *1/00*

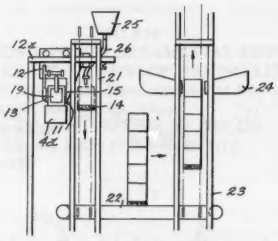
U.S. Cl. 156—297 **11 Claims**

1. Process for mechanically constructing a vertical wall section from blocks and mortar, wherein said process comprises the steps of:

a. placing a row of said blocks onto a horizontal conveying means, with said blocks having their top surface pointing upwardly and horizontally conveying said rows of blocks;

b. inserting further blocks into spaces between said rows, said further blocks having different horizontal dimensions than said first-mentioned blocks;

c. applying mortar to the top surface of said blocks by a mortar applying means disposed at a predetermined height above said first horizontal conveying means;



d. transporting rows of said blocks having overall lengths corresponding to a course of blocks in said wall section to a location; and

e. placing said lengths of blocks, one length on top of another onto a descending support means and descending said lengths stepwise between each successively received length of blocks whereby a vertical wall section is mechanically formed from said first-mentioned blocks and said further blocks on descending support means.

3,881,982

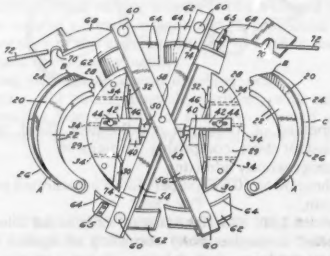
METHOD FOR BONDING BRAKE LININGS

Thomas E. Morgan, Sr., and Thomas E. Morgan, Jr., both of Detroit, Mich., assignors to Leonard Friedman, Beverly Hills, Calif.

Division of Ser. No. 139,005, April 30, 1971, Pat. No. 3,752,062. This application June 4, 1973, Ser. No. 366,744

Int. Cl. C09j *5/00*; B23p *15/18*; F16d *69/04*

U.S. Cl. 156—309 **4 Claims**



2. A method of bonding brake linings to brake shoe tables which comprises:

a. supporting one or more brake shoe tables circumferentially,

b. disposing a brake lining to be bonded on the outer surface of a brake shoe table,

c. providing a heat curable bonding material on the mating surfaces of said lining and table,

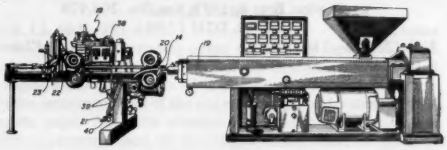
d. applying a pressure to the lining and the table to urge the table toward the lining in a range of 1500 to 3000 pounds per square inch, and

e. maintaining said pressure while subjecting the lining and the table to a heat of a curing furnace.

3,881,983
RING FORMING MACHINE

Bruce N. Smith, Seabrook, N.H., assignor to Spherex, Inc., Seabrook, N.H.

Filed Nov. 13, 1972, Ser. No. 305,991
Int. Cl. B29h *11/00*
U.S. Cl. 156—404 **30 Claims**

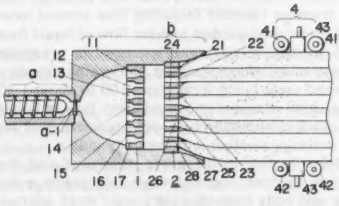


1. Apparatus for the production of annular articles from elongated workpieces of thermoplastic material, the elongated workpiece having a first and a second end, comprising:
   a. a base,
   b. a first clamp movably attached to the base and adapted to grasp the first end of the workpiece,
   c. a second clamp movably attached to the base and adapted to grasp the second end of the workpiece,
   d. a heating plate movably mounted on the base and having first and second opposed, parallel surfaces,
   e. positioning means for presenting the first end of the workpiece to the first surface of the plate, and
   f. a manipulator which causes the second clamp to present the second end to the second surface of the plate,
   the elongated workpieces having a longitudinally-directed concave groove and each of the clamps including a protuberance of shape corresponding to the groove and positioned to engage the groove when the ends of the workpiece are held by the clamps.

3,881,984
APPARATUS FOR PREPARATION OF SYNTHETIC WOOD

Shigenari Soda, Kyoto; Tatsujiro Seki; Shigeru Daiguji, and Motoshige Hayashi, Nara, all of Japan, assignors to Sekisui Kaseihin Kogyo K.K.

Division of Ser. No. 61,247, Aug. 5, 1970, Pat. No. 3,720,572. This application Jan. 9, 1973, Ser. No. 322,130
Claims priority, application Japan, Aug. 7, 1969, 44-62749
Int. Cl. B29b *5/00*
U.S. Cl. 156—500 **33 Claims**

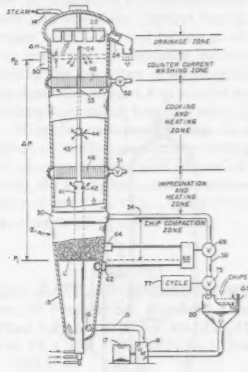


1. In an apparatus for preparing synthetic wood which includes an extruding means for extruding softened thermoplastic resin containing expanding agents, die means disposed at the discharge end of said extruding means adapted to permit the extruded thermoplastic resin to pass therethrough to form a plurality of expanded strands, said die means including a first chamber and at least one plate having a plurality of apertures therethrough disposed on the outlet side of said chamber, and coalescing means disposed at the outlet side of said die means for coalescing said plurality of expanded strands into a microporous article having a desired cross-sectional area while said strands are still in a softened state, the improvement comprising at least one of said die and said coalescing means being constructed to restrict the space in which each individual strand is allowed to expand to provide each of said strands with a higher density outer surface.

3,881,985
CONTINUOUS DIGESTER WITH STRAINER VALVE CYCLING

Frederick William Simmons, Amherst, and Karl Edwin Vogel, Hollis, both of N.H., assignors to Improved Machinery, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 196,391, Nov. 8, 1971, abandoned, which is a continuation of Ser. No. 37,436, May 14, 1970, abandoned, which is a continuation of Ser. No. 641,935, May 29, 1967, abandoned. This application Nov. 30, 1973, Ser. No. 420,669
Int. Cl. D21c *3/24*
U.S. Cl. 162—17 **1 Claim**



1. In a process for the continuous pulping of a mass of wood chips in an upright elongated reaction vessel
   having an entrance end and an exit end, wood chip-liquid infeed means including a pump adjacent the entrance end of said vessel for feeding wood chips and liquid into the entrance end of said vessel and onto the entrance end of said mass, wood chip discharge means adjacent the exit end of said vessel for discharging said wood chips, propelling liquid strainer means including a strainer valve, said strainer means being positioned in a wall of said vessel spaced between said infeed means and said discharge means for removal of liquid from said vessel, and liquid recirculating means connected between said strainer valve and said infeed means,
   feeding substantially continuously said wood chips and a liquid into said reaction vessel through said infeed means thereof to maintain a columnar mass of compacted wood chips therein, advancing the wood chip mass to move it throughout the length of said vessel, meanwhile treating the same in liquid submergence, and substantially continuously discharging said wood chips from the output end of said column at said discharge means,
   that improvement which consists of:
   cyclically operating said strainer valve to generate liquid propelling pulses, wherein said valve cyclically opens to recirculate liquid from said strainer means to said infeed means, and alternately cyclically closes to cause liquid propelling pulses to be generated throughout the submerged mass of wood chips to cause the rate of move-

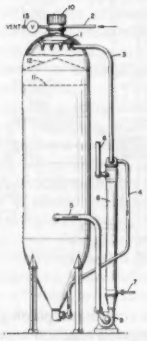
ment of said submergence liquid relative to said wood chips in said mass to vary cyclically to produce a cyclic advancing movement of said liquid effective to advance the wood chips throughout the length of said column from said infeed to said discharge means.

3,881,986

METHOD OF PRODUCING HOMOGENEOUSLY DELIGNIFIED PULP FROM FIBROUS MATERIAL, CONTAINING LIGNOCELLULOSE, IN A DIGESTER PARTIALLY FILLED WITH LIQUOR

Sture Olof Erik Backlund, Sundsvall, Sweden, assignor to Svenska Cellulosa Aktiebolaget, Sundsvall, Sweden

Continuation-in-part of Ser. Nos. 56,121, July 2, 1970, abandoned, and Ser. No. 857,620, Aug. 29, 1969, abandoned, and Ser. No. 529,887, Feb. 24, 1966, abandoned. This application June 4, 1971, Ser. No. 150,017
Claims priority, application Sweden, Feb. 25, 1965, 2468/65
Int. Cl. D21c *1/02*
U.S. Cl. 162—19 8 Claims



1. In a method of impregnating lignocellulose fibrous material in the cooking of pulp from wood chips in a digester, the improvement which comprises

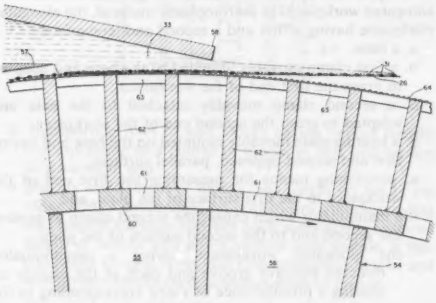
1. introducing wood chips and a cooking liquor into a digester with the volume of cooking liquor being less than the volume of the digester whereby there is a vapor space above the liquor;
2. circulating liquor from the bottom of the digester to the top thereof and through at least one centrifugal nozzle thereby spraying liquor substantially uniformly over the chips throughout substantially the entire cross-sectional area of the digester;
3. stopping circulation of liquor; and
4. thereafter introducing steam into the space above the liquor and chips while the digester is closed thereby elevating the pressure in the digester above atmospheric pressure while simultaneously heating the chips and liquor to cooking temperature thereby impregnating liquor wet chips with liquor.

3,881,987

METHOD FOR FORMING APERTURED FIBROUS WEBS

Charles S. Benz, Glen Mills, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. Nos. 1,945, Dec. 31, 1969, abandoned, and Ser. No. 1,947, Dec. 31, 1969, abandoned, and Ser. No. 1,948, Dec. 31, 1969, abandoned, which is a division of Ser. No. 671,800, Sept. 29, 1967, Pat. No. 3,549,742. This application Dec. 6, 1971, Ser. No. 204,928
Int. Cl. D21f *11/06*
U.S. Cl. 162—116 3 Claims



1. A method for forming an apertured fibrous web, said method comprising the steps of:

a. preparing a stock mixture comprising liquid and fibers;
b. delivering said stock mixture in the form of a slice substantially parallel to an upper surface of a moving drainage member and at a speed which is different from the speed of said drainage member for creating eddy currents in said stock mixture on said drainage member, said drainage member having an upper surface and a lower surface and a plurality of apertures connecting said upper and lower surfaces, said apertures being substantially uniformly dispersed throughout said drainage member, said drainage member including flow control means affixed thereon adapted to prevent flow of liquid from said stock mixture through the apertures in predetermined areas of said drainage member, the number of said predetermined areas being from about 100 to about 1,300 per square inch of said member, whereby flow of liquid from said stock mixture through said predetermined areas of said drainage member is prevented; and
c. applying suction to the lower surface of said drainage member to draw liquid through said drainage member while said eddy currents exist in said stock mixture, said eddy currents sweeping away fibers from areas in said stock mixture which overlie flow control means to form apertures in overlying relationship with said flow control means, said suction applying a force against the fibers in areas other than said predetermined areas for holding the fibers on said drainage member in said other areas for forming substantially continuous fibrous web portions, whereby an apertured fibrous web is formed upon said drainage member, said web having a number of apertures substantially corresponding to the number of said predetermined areas.

3,881,988

ANTISTATIC PAPER

Toshitaka Yasuda, Suita, Japan, assignor to Tatsuta Electric Wire & Cable Co., Ltd., Higashi-Osaka, Japan

Filed Mar. 13, 1973, Ser. No. 340,896

Claims priority, application Japan, Mar. 17, 1972, 47-28329. The portion of the term of this patent subsequent to Aug. 8, 1989, has been disclaimed.

Int. Cl. D21h *3/66*

U.S. Cl. 162—181 A 3 Claims

1. An antistatic printing paper comprising paper fibers and a paper filler characterized in that an antistatic agent of HLB ranging from above 9 to 17 is absorbed or caused to adhere to the entirety or part of the paper filler in greater density than to the paper fiber, the amount of antistatic agent being less than 5 percent based on the weight of the filler, the amount of the filler being up to 30 percent by weight of the paper.

3,881,989

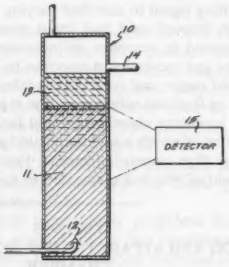
METHOD OF DETECTING A FUEL ELEMENT FAILURE

Paul Cohen, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 23, 1973, Ser. No. 381,633

Int. Cl. G21c *17/04*

U.S. Cl. 176—19 LD 4 Claims



1. A method of identifying small quantities of radioactive iodine in the presence of large quantities of radioactive sodium comprising equilibrating the radioactive sodium with a molten mixture of barium iodide and strontium iodide whereby the radioactive iodine present therein exchanges with the iodine present in the molten mixture, removing the radioactive sodium and monitoring the molten mixture for the presence of radioactive iodine.

3,881,990

METHOD OF TRANSPORTING AND STORING ORGANS WHILE RETAINING THE ORGANS IN A VIABLE CONDITION

Thomas A. Burton, Rochester, and Allen W. Moberg, Minneapolis, both of Minn., assignors to Waters Instruments, Inc., Rochester, Minn.

Division of Ser. No. 201,739, Nov. 24, 1971, Pat. No. 3,777,507. This application Sept. 26, 1973, Ser. No. 400,713

Int. Cl. C12k *9/00*

U.S. Cl. 195—1.7 10 Claims

1. In the method of preserving and maintaining an organ in a viable state in a cassette that has a perfusate circulatory system that includes an organ chamber, a venous reservoir, an oxygenator, a heat exchanger, and an arterial reservoir, placing the cassette in a manually portable transport module that has a cooling fluid source for supplying cooling fluid to the cassette heat exchanger and an oxygen source for supplying oxygen to the cassette, transporting the combination of the cassette and transport module to the site of a donor organ, placing the donor organ in the organ chamber, and connecting the organ in the circulatory system to perfuse the organ, transporting the combination of the cassette and transport module to an organ transplant site that is remote from said site of the donor organ, removing the cassette with the organ therein from the transport module at the transplant site, and while the organ is connected in the circulatory system, manually transferring the cassette from the transport module to an in-hospital support unit that has sources for supplying cooling fluid and oxygen to the heat exchanger and oxygenator respectively.

3,881,991

PROCESS FOR PRODUCING AMYLOSE POWDERS HAVING A MEAN DEGREE OF POLYMERIZATION BETWEEN 20–30

Masashi Kurimoto, and Kaname Sugimoto, both of Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

Continuation of Ser. No. 5,907, Jan. 26, 1970, abandoned. This application Aug. 24, 1972, Ser. No. 283,392

Claims priority, application Japan, Jan. 24, 1969, 44-5125

Int. Cl. C10d *13/04*; C13l *1/08*

U.S. Cl. 195—31 R 7 Claims

1. A process for producing amylose powders of crystalline helical structure and low water content having a mean polymerization degree of 20 – 30 and having good solubility and flavor-retaining properties, comprising gelatinizing a starch slurry, hydrolyzing the branches of amylopectin with an enzyme that hydrolyzes the alpha-1,6-glucoside bonds of amylopectin until an amylosic starch having a mean polymerization degree of 20 – 30 is obtained, precipitating the amylose to the form of a helical cyrstalline precipitate having a low water content and a mean polymerization degree of 20 – 30, partially dehydrating the precipitate, and thereafter, with a material temperature of less than 45°C., spray drying the partially dehydrated precipitate to a powdery form.

3,881,992

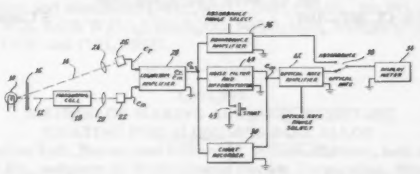
OPTICAL RATE MEASUREMENT METHOD

Wilson Ralston, 99 Prospect St., Stamford, Conn. 06901

Filed July 2, 1973, Ser. No. 375,418

Int. Cl. C12k *1/00*; G01j *3/42*, *3/48*

U.S. Cl. 195—103.5 R 5 Claims



1. A method for kinetic enzyme analysis for rapidly providing an indication of the linearity of enzyme reaction comprising:

combining a reagent with a sample composition for causing an enzyme catalyzed reaction thereof;

said reaction exhibiting a lag phase, an intermediate reaction phase and a terminating substrate exhaustion phase; projecting a light beam at the composition as the reaction progresses;

detecting the absorbance of said light beam and providing a first electrical signal which is proportional to the absorbance of the light by the composition undergoing reaction;

applying said first signal to signal filtering and differentiating means for providing a second electrical signal which is substantially proportional to the first derivative of the first absorbance signal;

causing reactive elements of a signal filtering and differentiating means to equilibrate to a zero rate condition prior to analysis;

continuously averaging the second signal for a predetermined interval of time from said zero rate condition in order to suppress undesired randomly occurring noise components; and,

applying the second signal to an indicating means and providing a continuous visual display which, after said interval of time, is representative of the rate of change of the reaction.

3,881,993

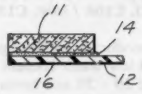
TESTING DEVICE FOR MICROORGANISMS

Ronald Freake; Leon Francis Strenkoski; Daniel Glen Aitken, all of Elkhart, Ind., and Billy Harper Haden, Rochester, N.Y., assignors to Miles Laboratories, Inc., Elkhardt, Ind.

Continuation-in-part of Ser. No. 124,671, March 16, 1971, abandoned. This application May 7, 1973, Ser. No. 357,933

Int. Cl. C12k *1/00*

U.S. Cl. 195—139 **12 Claims**



1. A test device for analyzing a sample for microorganisms, said device being adapted to be inoculated with the sample and incubated in a sealable container, the device comprising: an absorbent matrix impregnated with a nutrient medium, a reagent, and a water soluble culture-fixing agent capable of forming a viscous suspension in an aqueous solution to localize the microorganisms on said matrix.

3,881,994

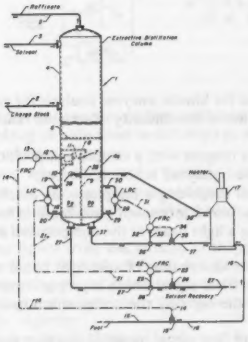
DISTILLATION COLUMN REBOILER CONTROL SYSTEM

R. Gene Fickel, Roselle, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 11, 1974, Ser. No. 459,975

Int. Cl. B01d *3/42;* **C10g** *7/00*

U.S. Cl. 202—160 **5 Claims**



1. A control system for regulating the heat input to the reboiler section of a distillation column which comprises, in cooperative combination:

a. a chamber in said reboiler section for receiving liquid bottoms material from the fractionation section of said column;

b. a reboiler heater having feed input means thereto connected to said chamber, flow regulating means for controlling the flow of said liquid bottoms from said chamber to said reboiler heater in accordance with the liquid level in said chamber;

c. conduit means in interconnection with said reboiler heater for passing heated, mixed-phase bottoms material from said heater into a partitioned and segregated portion of said chamber in said reboiler section;

d. fuel-varying means in a fuel input means in interconnection with said heater for adjusting the fuel input to said heater;

e. vapor flow-measuring means in said reboiler section responsive to the total quantity of upward flowing vapor from said mixed-phase bottoms material passing from said segregated portion of said reboiler section upwardly into the fractionation section of said distillation column, said flow measuring means being internally disposed within said segregated portion of said reboiler section; and

f. signal-generating means in said segregated portion of said reboiler section for establishing a signal representative of the volumetric flow rate of vapor from said segregated portion passing into said fractionation section, and signal transmitting means for modifying and transmitting the resulting signal to said fuel varying means, whereby fuel input through said fuel input means to said heater is decreased in response to increasing flow rates of said vapor and increased in response to decreasing flow rates of said vapor; said control system being further characterized in that said reboiler section is partitioned to provide two inventory chambers of said liquid bottoms material, the first of which is said segregated portion which has said vapor flow measuring means disposed therein and the second of which is connected to said freed input means.

3,881,995

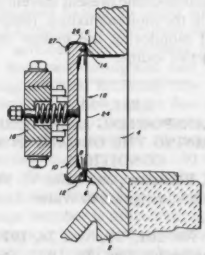
METHOD AND APPARATUS FOR SEALING A COKING CHAMBER

Herbert A. White, Jr., 2516 Collin Rd., Pittsburgh, Pa. 15235

Filed Dec. 17, 1973, Ser. No. 425,303

Int. Cl. C10b *1/06, 25/06, 25/24*

U.S. Cl. 202—248 **10 Claims**



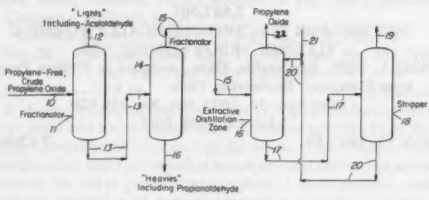
1. In a coke oven or the like having an elongated heating chamber for receiving coal to be coked, a door opening at an end of said chamber, a door jamb surrounding the door opening and having a flat sealing surface extending around its periphery, and a door having a sealing edge extending around the periphery thereof and adapted to engage said sealing surface, said sealing edge being at the end of a metal strip arranged generally normal to said sealing surface; the improvement comprising a detachable relatively thin high temperature resistant, deformable and compressible sealing member adapted to be received between said sealing surface and

said sealing edge for the full extent of the edge, said sealing member including a plurality of contacting layers with one outer layer adapted to rest on said sealing surface and the other outer layer adapted to bear against said sealing edge.

3,881,996
RECOVERY OF PROPYLENE OXIDE BY PLURAL STAGE DISTILLATION

John P. Schmidt, Princeton, N.J., assignor to Oxirane Corporation, Princeton, N.J.

Filed Nov. 21, 1973, Ser. No. 417,809
Int. Cl. B01d *3/00*
U.S. Cl. 203—71 **6 Claims**



1. In a process for recovering propylene oxide in a high state of purity from a crude propylene oxide product obtained by the catalytic epoxidation of propylene with an organic hydroperoxide, said product including propylene, propylene oxide, acetaldehyde, propionaldehyde, and other material having a higher boiling point than that of propylene oxide, the improvement consisting of the sequential steps of

a. removing propylene by distillation from said product to obtain a substantially propylene-free crude propylene oxide product, followed by

b. charging the said substantially propylene-free, crude propylene oxide product into a first fractionator, withdrawing therefrom a first distillation overhead containing acetaldehyde, and withdrawing therefrom a first distillation bottoms containing propylene oxide, propionaldehyde, and said material having a higher boiling point than that of propylene oxide, followed by

c. charging the said first distillation bottoms to a second fractionator, withdrawing therefrom a second distillation overhead containing propylene oxide substantially free of aldehydes and of said higher boiling material, and withdrawing therefrom a second distillation bottoms containing said higher boiling material.

3,881,997
METHOD FOR VOLTAMMETRIC DETERMINATION OF NITRATE AND NITRITE

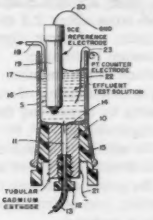
Dennis C. Johnson, and Ronald J. Davenport, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Mar. 27, 1974, Ser. No. 455,292
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T **10 Claims**

1. The voltammetric method of determining the concentration of small amounts of nitrate and/or nitrite in water, characterized by the steps of:

a. maintaining a cadmium electrode at a negative potential in the range of −0.80 to −1.15 volts with reference to a saturated calomel electrode;

b. contacting an aqueous test solution with said cadmium electrode, said solution containing up to about 15 ppm nitrogen as an unknown concentration of nitrate and/or nitrite, said solution having a hydrogen ion concentration in the range of 0.001 to 5 molar favoring the reduction of said nitrogen oxide ion to hydroxylamine; and



c. detecting the current flow between said cadmium electrode and a counter electrode in contact with said test solution.

3,881,998
METHOD OF AFTER-TREATMENT FOR LITHOGRAPHIC PRINTING PLATES

Yushiaki Miyosawa, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Hiratsuka, Japan

Filed July 23, 1973, Ser. No. 382,026
Claims priority, application Japan, July 27, 1972, 47-75277; July 27, 1972, 47-75276
Int. Cl. B41c *3/08;* **B41n** *1/04;* **C23b** *9/02*
U.S. Cl. 204—17 **13 Claims**

1. A method of after-treatment for lithographic printing plates having an aluminum substratum for producing a hydrophilic chemical conversion coating on the non-image areas thereof, wherein said printing plates have an oleophilic and electrically non-conductive image areas on the surface of said aluminum substratum, which comprises passing electric current through the surface of the non-image area of said aluminum substratum by applying an electric voltage between said aluminum substratum and a counter electrode in an aqueous solution of at least one water-soluble oxyacid salt selected from the group consisting of silicates, chromates, stannates, molybdates, phosphomolybdates, tungstates, vanadates, borates and phosphates of lithium, sodium, potassium, ammonium and aluminum, $(NH_4)_4W_5O_{17}$, $(NH_4)_6W_7O_{24}$, $Na_3PO_4 \cdot 12WO_3$, $Ba[B(W_2O_7)_6]$, $Na_2B_{10}O_{16}$, $NaBO_2 \cdot H_2O_2$, $NaH_2BO_3 \cdot 2H_2O$, $COOH$ and $(NH_4)HB_4O_7$.

3,881,999
METHOD OF MAKING ABRASION RESISTANT COATING FOR ALUMINUM BASE ALLOY

Julius Toth, Beaver, and Edward M. Walker, Industry, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 25, 1973, Ser. No. 364,173
Int. Cl. C23b *5/50;* **C23f** *17/00*
U.S. Cl. 204—33 **17 Claims**

1. A method for applying an abrasion resistant coating on the surface of an aluminum-base alloy member comprising the steps of:

1. cleaning the surface of the member;
2. rinsing the surface of the member;
3. applying an aqueous deoxidizing solution to the surface of the member;
4. rinsing the surface of the member;
5. applying a coating of tin by immersing the member in an aqueous solution consisting essentially of, for each gallon of water, from about 8 to about 14 ounces of at least one tin-containing compound selected from the group consisting of sodium stannate and potassium stannate, and of from about 1 to 10 ounces of a chelating agent;
6. electroplating a coating of a copperbase alloy on the tin coating by immersing the member in an electrolyte consisting essentially of, for each gallon of water, from about

3.5 to about 5.5 ounces of at least one compound selected from the group consisting of sodium stannate and potassium stannate, from about 1.5 to about 2.5 ounces of copper cyanide, from about 2.5 to about 3.5 ounces of potassium cyanide, and from about 0.5 to about 1.3 ounces of potassium hydroxide;

7. rinsing the surface of the member;

8. electroplating a first coating of copper on the copper-base alloy coating by immersing the member in an electrolyte consisting essentially of, for each gallon of water, from about 3 to about 4 ounces of copper cyanide, of from about 6 to about 7 ounces of at least one compound selected from the group consisting of sodium cyanide and potassium cyanide, and of from about 4 to about 6% of potassium-sodium tartrate;

9. electroplating a second coating of copper on the first coating of copper by immersing the member in an electrolyte consisting essentially of, for each gallon of water, from about 8 to about 10 ounces of copper cyanide, of from about 14 to about 16 ounces of at least one compound selected from the group consisting of sodium cyanide and potassium cyanide; and

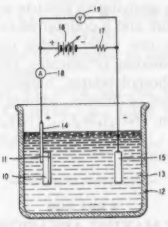
10. electroplating an outer coating of a metal selected from a group consisting of silver and tin to the second coating of copper.

3,882,000

FORMATION OF COMPOSITE OXIDES ON III-V SEMICONDUCTORS

Bertram Schwartz, Westfield; Stuart Marshall Spitzer, Berkeley Heights, and Gregory Dyett Weigle, Green Brook, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1974, Ser. No. 468,423
Int. Cl. C23f *17/00*; H01l *7/18*
U.S. Cl. 204—38 A **12 Claims**



1. A method of forming a composite oxide on a structure comprising a III-V compound semiconductor comprising the steps of:

forming on said structure over a major portion of the surface of said semiconductor a layer of a conducting metal of uniform thickness which is oxidizable in an electrolytic system wherein the electrolyte comprises a material selected from the group consisting of H_2O adjusted to a pH in the range **1-5** or **9-13**, H_2O in a pH range of **5-9** including a material for supplying ions to add conductivity, and an H_2O_2 solution;

making the structure the anode in said electrolyte system; and

passing a direct current through said system of sufficient magnitude such as to oxidize the entire thickness of said conductor and a portion of the underlying semiconductor over all of the area of said semiconductor surface covered by said conductor to form said composite oxide.

11. A method of forming a composite oxide on a structure comprising a III-V compound semiconductor comprising the steps of:

forming on said structure over a major portion of the surface of said semiconductor a layer comprising Zn to a non-uniform thickness so that said layer includes relatively thick portions and thin portions;

making the structure the anode in an electrolytic system wherein the elctrolyte comprises a material selected from the group consisting of H_2O adjusted to a pH in the range 1–5 or 9–13, H_2O in the pH range 5–9 including a material for supplying ions to add conductivity, and an H_2O_2 solution; and

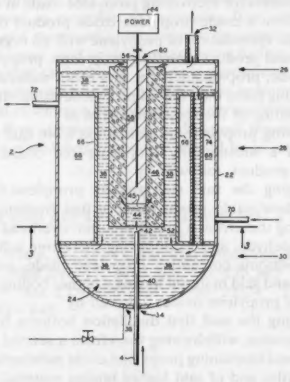
passing a direct current through said system of sufficient magnitude such as to oxidize the entire thickness of said Zn layer only in the thin portions of said layer and a portion of the underlying semiconductor over the area of semiconductor covered by said thin portions to form a composite oxide in said area.

3,882,001

METHOD FOR ELECTROCHEMICALLY FORMING FLUOROCARBON COMPOUNDS

King L. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 30, 1973, Ser. No. 420,529
Int. Cl. B01k *3/04*
U.S. Cl. 204—59 **7 Claims**



1. A method for forming a fluorocarbon compound, comprising:

injecting a vaporized recycle feed stream comprising a mixture of a fluorinatable organic compound and a partially unreacted fluorinated compound, said recycle feed stream containing 5–50 weight percent hydrogen fluoride, into an electrolyte of an electrochemical fluorination cell at a location within said electrolyte and adjacent a plenum chamber within an anode;

passing all of said hydrogen fluoride-containing recycle feed through the electrolyte and into contact with said anode of the cell for fluorinating at least a portion of the fluorinatable organic compound and the partially unreacted fluorinated compound of said mixture;

recovering resultant gases from the cell;

separating said fluorinatable organic compound and said partially unreacted fluorinated compound from said resultant gases for said recycle; and

separating and recovering said fluorocarbon compound from said resultant gases.

3,882,002

ANODE FOR ELECTROLYTIC PROCESSES

Edward H. Cook, Jr., Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,110
Int. Cl. C01d 1/06; C01b 7/06; B01k 3/06
U.S. Cl. 204—98 9 Claims

1. An electrolytic anode comprising a valve metal substrate, a coating thereon of conductive tin oxide, and an outer coating of at least one of a noble metal or noble metal oxide.

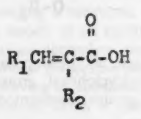
3,882,003

VINYL ESTER RESIN AND PROCESS FOR CURING SAME WITH IONIZING RADIATION IN THE PRESENCE OF AMINES

Inder Mani, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 142,853, May 13, 1971, Pat. No. 3,816,283. This application Aug. 27, 1973, Ser. No. 391,108
Int. Cl. C08d 1/00; C08f 1/00
U.S. Cl. 204—159.16 8 Claims

1. A process for curing a mixture of a polymerizable vinyl ester resin and a nonvolatile vinyl monomer selected from the group consisting of vinyl carboxylic acids, vinyl nitriles, vinyl amides, alkyl and hydroxyalkyl esters of vinyl carboxylic acids wherein the alkyl group contains from 1 to 8 carbons, and mixtures thereof, said process comprises exposing said mixture in an inert atmosphere to ionizing radiation, said mixture having added thereto about 2 to 5 weight percent based on the weight of the mixture of an amine having the formula $R_1R_2R_3N$ where R_1 is an alkyl or aralkyl group, R_2 is hydrogen and R_3 may be hydrogen or an alkyl group or R_1 and R_3 together may be a cyclic alkylene radical or an oxydialkylene radical; and wherein said vinyl ester resin is prepared by reacting essentially equivalent amounts of a polyepoxide of a polyhydric phenol having more than one epoxide group per molecule with an unsaturated acid having the formula



where R_1 is chlorine, bromine, hydrogen or phenyl and R_2 is hydrogen, chlorine, bromine or a loweralkyl group of 1 to 4 carbon atoms.

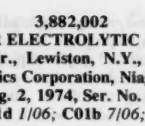
3,882,004

VINYL ESTER RESIN AND PROCESS FOR CURING SAME WITH IONIZING RADIATION IN THE PRESENCE OF AMINES

Inder Mani, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 143,266, May 13, 1971, Pat. No. 3,810,825. This application Aug. 27, 1973, Ser. No. 391,112
Int. Cl. C08d 1/00; C08f 1/00
U.S. Cl. 204—159.16 4 Claims

1. A process for curing a mixture of an alkenyl aromatic monomer and a polymerizable vinyl ester resin, said process comprises exposing said mixture in an inert atmosphere to ionizing radiation said mixture having added thereto about 1.5 to 5 weight percent based on the weight of the mixture of an amine having the formula $R_1R_2R_3N$ where R_1 is an alkyl or aralkyl group, R_2 is hydrogen and R_3 may be hydrogen or an alkyl group or R_1 and R_3 together may be a cyclic alkylene radical or an oxydialkylene radical; and wherein said vinyl ester resin is prepared by reacting about equivalent amounts of a polyepoxide of a polyhydric alcohol having more than one epoxide group per molecule with a dicarboxylic acid half ester having the formula



where R_1 is hydrogen or an alkyl group of 1 to 4 carbons, R_2 is an alkylene group of 2 to 6 carbons and R_3 is phenylene, cyclohexylene, alkylene or an unsaturated bivalent hydrocarbon radical.

3,882,005

PROCESS FOR PREVENTING DISCOLORATION IN HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMERS BY EXPOSURE TO RADIATION

John M. Hoyt; Karl Koch, and Mathew Williams, Jr., all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed July 10, 1973, Ser. No. 377,997
Int. Cl. B01j 1/10, 1/12
U.S. Cl. 204—159.14 16 Claims

1. A process for the hydrolysis of a solid interpolymer of an α-olefin of 2–10 carbon atoms and about 1–25 mole percent vinyl ester of a 2–6 carbon atom saturated aliphatic carboxylic acid to a product having a low yellowness index (ASTM D-1925-63T) of less than 30 which comprises contacting said solid interpolymer with a substantially anhydrous alcoholizing agent for a time sufficient to reduce the residual vinyl ester content to 0.1–15 weight percent and subjecting at least one of said interpolymer and said hydrolyzing agent to irradiation of wave lengths in the range of about 3000–8000 Angstrom units.

3,882,006

METHOD FOR CURING ALKYD RESIN COMPOSITIONS BY APPLYING IONIZING RADIATION

Tadashi Watanabe; Koichiro Murata, and Tsutomu Maruyama, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd.

Continuation of Ser. No. 91,204, Nov. 19, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,977
Claims priority, application Japan, Nov. 27, 1969, 44-94679
Int. Cl. B01j 1/10, 1/12
U.S. Cl. 204—159.15 7 Claims

1. A method for curing alkyd resin compositions which comprises applying ionizing radiation in a total radiation dose of from 0.1 to 50 M rad to an alkyd resin composition comprising

a. styrene; and

b. an alkyd resin product consisting essentially of the half-esterification product of (1) a conjugated unsaturated fatty acid or conjugated unsaturated fatty oil, selected from the group consisting of tung oil, linseed oil, linolic and dehydrated castor oil, modified alkyd resin, said alkyd resin of ingredients comprising phthalic anhydride, pentaerythritol, and trimethylol ethane or glycerine having an oil length of from 10 to 50 percent and a hydroxyl equivalent of 300–2000, and (2) maleic anhydride or citraconic anhydride, said anhydride being in an amount sufficient to react with at least 30 percent of the hydroxyl groups of said modified alkyd resin.

3,882,007

PHOTOHARDENABLE FATTY ACID-MODIFIED VINYLATED POLYESTER RESIN COMPOSITION

Tadashi Watanabe; Koichiro Murata, and Kenjiro Tsubouchi, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd.

Continuation of Ser. No. 221,076, Jan. 26, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,978

Claims priority, application Japan, Feb. 1, 1971, 46-3322

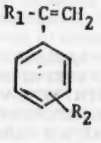
Int. Cl. B01d *1/10, 1/12;* **C08d** *1/00*

U.S. Cl. 204—159.15 **8 Claims**

1. A photohardenable fatty acid-modified vinylated polyester resin composition comprising

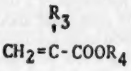
A. from about 10 to about 60 percent by weight of a vinyl monomer selected from the group consisting of

1. styrene and its derivatives

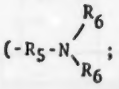


in which R_1 is hydrogen or methyl group and R_2 is hydrogen, methyl group or chlorine

2. acrylic or methacrylic monomers

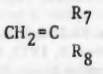


in which R_3 is hydrogen or methyl group and R_4 is hydrogen, alkyl group having one to 16 carbon atoms, hydroxyalkyl group having two to three carbon atoms, glycidyl group and dialkylamino alkyl group



R_5 is alkylene group having one to two carbon atoms and R_6 is alkyl group having one to two carbon atoms)

3. vinylidene monomer



in which R_7 is hydrogen or methyl group and R_8 is nitrile group, carbamoyl group, N-methylolcarbamoyl group, alkylether-N-methylolcarbamoyl group (—$CONHCH_2OR_9$; R_9 is alkyl group having one to four carbon atoms) or acetoxy group, or a mixture thereof;

B. from about 40 to about 90 percent by weight of a fatty acid-modified vinylated polyester resin selected from the group consisting of

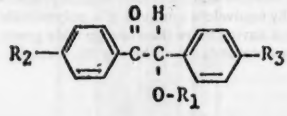
1. a fatty acid-modified vinylated polyester resin prepared by reacting 1.0 mole of a diisocyanate selected from the group consisting of toluene diisocyanate and hexamethylene diisocyanate with 0.7 to 1.3 moles of 2-hydroxyethylmethacrylate to provide an isocyanate-terminated adduct and then reacting 0.4 to 1.2 moles of said isocyanateterminated adduct per mole of a pendant hydroxyl of a linseed oil fatty acid or highly conjugated linoleic acid modified polyester resin of ingredients comprising isophthalic acid, neopentyl glycol, trimethylolpropane, and adipic acid, and

2. a fatty acid-modified vinylated polyester resin prepared by reacting 1.0 mole of a diisocyante selected from the group consisting of toluene diisocyanate and hexamethylene diisocyanate with 0.7 to 1.3 moles of 2-hydroxyethylmethacrylate to provide an isocyanate-terminated adduct and then reacting 0.4 to 1.2 moles of said isocyanate-terminated adduct per mole of pendant hydroxyl of a linseed oil fatty acid-modified polyester resin of ingredients comprising isophthalic acid, neopentyl glycol, trimethylolpropane and fumaric acid, said fatty acid-modified vinylated polyester resin having from 0.2 to 3.0 units of alpha, beta-olefinic unsaturation per 1,000 units molecular weight of said resin, a number average molecular weight of about 800 to about 5,000, a fatty acid content of about 5 to 35 percent by weight based on the total weight of the fatty acid and unmodified polyester resin, a number of hydroxyl groups of about 0.5 to 3.0 units per 1,000 units molecular weight, and an acid value of about 5 to about 30,

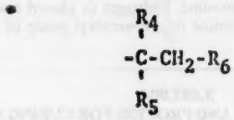
C. metal salt-dryer selected from cobalt, manganese, calcium, zinc, iron, zirconium, lead or copper salt in amount of about 0.1 to 2.0 percent by weight based on the total amount of the fatty acid-modified vinylated polyester resin and vinyl monomer, and

D. a photosensitizer of about 0.05 to about 10 percent by weight based on the total amount of the fatty acid-modified vinylated polyester resin and vinyl monomer in which said photosensitizer is one selected from the group consisting of the following formulas:

1. benzoin and its derivatives



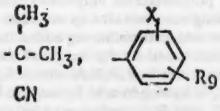
in which R_1 is hydrogen, alkyl group having from one to 18 carbon atoms, methylcyclohexyl group, benzyl group or ethylether derivative groups represented by the general formula



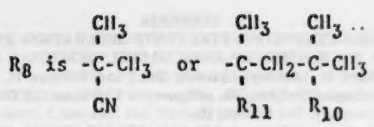
in which R_4 or R_5 is hydrogen or methyl group and R_6 is alkoxy group having one to four carbon atoms, acetyl group having one to four carbon atoms or alkoxyalkyl group having one to six carbon atoms,

2. azo compounds

in which R_7 is

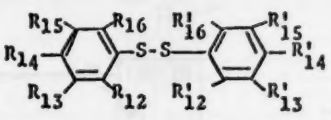


(R_9 is hydrogen, chlorine or alkyl group having one to three carbon atoms and X is hydrogen, chlorine or bromine),



(R_{10} is hydrogen, methyl group or methoxy group, and R_{11} is hydrogen or nitrilo group), and

3. diphenyl disulfide and its derivatives



in which R_{12} and R_{12}' are hydrogen, methyl group or chlorine, R_{13} and R_{13}' are hydrogen or methyl group, R_{14} and R_{14}' are hydrogen, chlorine, alkyl group having one to four carbon atoms or methoxy group, R_{15} and R_{15}' are hydrogen, chlorine or methyl group, and R_{16} and R_{16}' are hydrogen or methyl group.

3,882,008

WATER-SOLUBLE AND/OR WATER-DISPERSIBLE COATING MATERIAL AND COMPOSITION

Michio Hiraoka, Tokyo, and Hisao Nakada, Niigate, both of Japan, assignors to Nippon Soda Kabushiki Kaisha, Tokyo-to, Japan

Division of Ser. No. 668,202, Sept. 15, 1967, abandoned. This application Mar. 11, 1971, Ser. No. 123,406

Claims priority, application Japan, Sept. 20, 1966, 41-61666

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **7 Claims**

1. A method of coating a substrate, comprising arranging the substrate as the anode of an electrolytic cell having an anode, a cathode and an electrolyte, the electrolyte comprising an aqueous solution or dispersion of a butadiene homopolymer or copolymer having at substantially each end of substantially each polymeric chain a carboxyl or carboxylate group and wherein number average molecular weight is in the range of 200 to 10,000, carboxylic equivalent is less than 5,000, butadiene unit in the polymeric chain is more than 50 weight percent, 1,2-butadiene bonding in the butadiene unit is more than 80 weight percent, at least 80% of the total of the carboxyl and carboxylate groups are carboxylate groups, and the carboxylate is alkali metal, ammonium or organic ammonium carboxylate and applying an electromotive potential across the cell whereupon the butadiene homopolymer or copolymer deposits on the anodic substrate.

3,882,009

ELECTRODEPOSITION OF ISOTHIOURONIUM STABILIZED LYOPHOBIC COLLOIDS

Earl H. Wagener, Concord, Calif.; Ritchie A. Wessling, and Dale S. Gibbs, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1973, Ser. No. 392,700

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **10 Claims**

1. A method for applying a coating to an object having an electroconductive surface comprising

1. immersing the object in a coating bath comprising a latex having a pH in the range from about 2 to about 12 of cation-active particles of water-insoluble, essentially electrically non-conductive, organic, film-forming polymer wherein a substantial portion of the cation-activity is provided by isothiouronium cations; said latex having a conductivity of from about 300 micromhos to about 3,500 micromhos per centimeter;

2. passing an electric current through said bath sufficient to effect deposition of a coating of said polymer on the object by providing a difference of electrical potential between the object and an electrode that is

a. spaced apart from said object

b. in electrical contact with said bath

c. electrically positive in relation to said object.

3,882,010

METHOD OF ELECTROPHORETICALLY FORMING FOUNDRY MOULDS

Ervin I. Szabo, Manotick, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Aug. 13, 1974, Ser. No. 497,039

Claims priority, application Canada, Oct. 26, 1973, 184329/73

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **7 Claims**

1. A method of electrophoretically forming a foundry mould, comprising:

a. coating a meltable mould former, which is electrically non-conductive, with graphite and refractory particles and a binder to form an electrically conductive coating thereon containing graphite to refractory particles in the range 1:10 to 1:1 by volume,

b. applying additional refractory particles electrophoretically to said electrically conductive coating,

c. applying further refractory particles to said electrically conductive coating to form a foundry mould, and

d. heating said mould former to melt it and then removing the molten mould former material from the foundry mould.

3,882,011

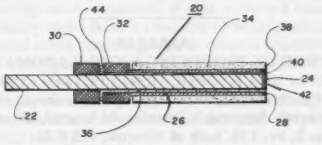
ELECTRODE FOR ELECTROANALYTIC STUDIES

Theodore G. Hines, Grove City, Pa., and Dennis C. Johnson, Ames, Iowa, assignors to Pine Instrument Company, Grove City, Pa.

Filed Dec. 26, 1973, Ser. No. 427,471

Int. Cl. G01n *27/30*

U.S. Cl. 204—195 R **18 Claims**

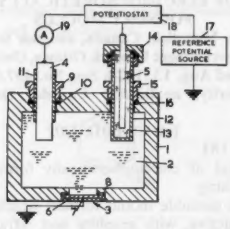


1. A rotatable electrode construction for electroanalysis of a fluid, said construction comprising a first contact and a second contact spaced therefrom, conductive members electrically engaging said first and said second contacts respectively for establishing conductive paths thereto, means for electrically isolating said first and said second contacts from one another and said conductive members from one another, brush members mounted respectively on said conductive members and spaced from said contacts, and means for sealing said contacts and said conductive members against the entry of said fluid so that said fluid is prevented from contacting said conductive members and non-contact surfaces of said first and said second contacts, at least one of said contacts being fabricated from glassy-carbon.

3,882,012
OXYGEN SENSORS

Thomas Dickinson, Newcastle-upon-Tyne, and Lynden John Greenley, Tonbridge, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom and Northern Ireland, London, England

Filed Nov. 26, 1973, Ser. No. 419,048
Claims priority, application United Kingdom, Nov. 24, 1972, 54329/72
Int. Cl. G01n 27/46
U.S. Cl. 204—195 P 26 Claims



1. An oxygen sensor comprising an electrochemical cell having a salt electrolyte which is molten at the temperature of operation of the sensor, a gas diffusion electrode as cathode, the gas diffusion electrode includiing a porous metal layer and a barrier layer substantially non-porous to the electrolyte but porous to oxygen interposed between the porous metal layer and the environment of the sensor, a counter electrode as anode, measuring means to determine the electrical current which flows between the anode and cathode of the electrochemical cell due to oxygen in the environment and wherein the electrochemical cell includes an electrode constituting either the anode or a reference electrode of the electrochemical cell, the said electrode comprising either (A) a soluble product electrode immersed in a salt electrolyte which is molten at the temperature of operation of the sensor or (B) a reactive electrode and the said electrode being separated from the salt electrolyte of the electrochemical cell by a membrane of ionically conducting solid through which cations of the salt electrolyte or cations of the reactive electrode respectively can be transported and provided that when a separate reference electrode is included a means is provided by which a constant potential is maintained between the gas diffusion electrode and the said separate reference electrode.

3,882,013
METHOD OF PRODUCING HIGHLY AROMATIZED LOW-SULPHUR HYDROCARBON PETROLEUM STOCK

Yakov Rafailovich Katsobashvili, ulitsa Vavilova, 49, kv. 43, and Anatoly Sergeevich Serenko, 44 kvartal, ulitsa Volgina, korpus 2, kv. 135, both of Moscow, U.S.S.R.

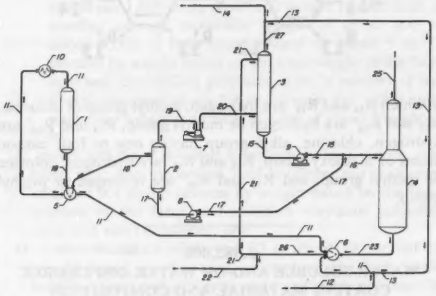
Filed Mar. 15, 1973, Ser. No. 341,592
Int. Cl. C10g 13/02
U.S. Cl. 208—60 18 Claims

1. A method of producing highly aromatized low-sulfur hydrocarbon petroleum stock, comprising destructive catalytic hydroaromatization of a straight run vacuum distillate boiling between 300° to 450°–560°C at a temperature of from 500° to 620°C, under a pressure of from 5 to 50 atm and at a space velocity of stock feed from 1 to 10 hr^{-1}, the hydrogen-stock ratio ranging from 500 to 3000 nm^3/t; isolating from the resultant hydroaromatizate a fraction boiling between 200° to 300°–400°C, and a residue that boils at a temperature over 300°–400°C; and isolating an aromatic concentrate from said hydroaromatizate fraction boiling between 200° to 300°–400°C wherein the catalysts comprise the oxides of the metals of Groups VI and VIII of the Periodic System, on solid carriers.

3,882,014
REACTION ZONE EFFLUENTS SEPARATION AND HYDROGEN ENRICHMENT PROCESS

Richard D. Monday, Houston, Tex., and Norman H. Scott, Arlington Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 301,009, Oct. 26, 1972, abandoned. This application June 24, 1974, Ser. No. 482,304
Int. Cl. C10g 35/04
U.S. Cl. 208—134 7 Claims



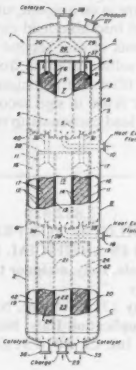
1. In a hydrocarbon conversion process wherein (1) a hydrocarbon charge stock and hydrogen are contacted in a catalytic reaction zone, (2) a hydrogen-containing hydrocarbon effluent stream is withdrawn from said zone, (3) said effluent is separated to provide a principally liquid phase and a principally vaporous phase, and (4) at least a portion of said vaporous phase is recycled to said reaction zone, the improvement comprising separating said effluent and increasing the hydrogen concentration of said recycled vaporous phase by the steps of:

a. partially condensing said hydrocarbon reaction zone effluent at a temperature from about 150°F to about 300°F and introducing the same into a vapor-liquid separation zone, therein effecting separation into a first hydrogen-containing vaporous phase and a first liquid phase;
b. introducing said first vaporous phase upwardly into a contacting-condensing zone and therein countercurrently contacting the same with a downwardly flowing, cooled fractionation bottoms material, at contacting conditions selected to effect condensation and selective absorption of a portion of said first vaporous phase;
c. recovering, from said contacting-condensing zone, a second vaporous phase enriched in hydrogen and a second liquid phase of said liquid bottoms material and the condensed-absorbed portion of said first vaporous phase;
d. recycling at least a portion of said second varporous phase to combine with said hydrocarbon charge stock;
e. fractionating a mixture of said first and second liquid phases, in a fractionation zone, at conditions selected to vaporize light components therefrom, and recovering the same as a third vaporous phase;
f. recovering a liquid bottoms material from said fractionation zone; and,
g. cooling said liquid bottoms material and passing at least a portion of the cooled material downwardly into said contacting-condensing zone to countercurrently contact said first vaporous phase therein.

3,882,015
COUNTERCURRENT CATALYTIC CONTACT OF A REACTANT STREAM IN A MULTI-STAGE PROCESS AND THE APPARATUS THEREFOR

Don B. Carson, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 29, 1973, Ser. No. 365,396
Int. Cl. B01j *9/12*; C10g *13/16*
U.S. Cl. 208—169 9 Claims



3. A process for effecting the multiple-stage, countercurrent contact and conversion of a reactant stream with catalyst particles movable through said stages via gravity-flow, which process comprises the steps of:

a. introducing said reactant stream into a central, lower portion of an elongated reaction chamber containing said multiple stages;

b. passing said reactant stream laterally, in radial flow, through a first annular-form catalyst bed in which the catalyst particles are movable via gravity-flow, and into a mixing zone above said first catalyst bed;

c. introducing a heat-exchange fluid into said mixing zone and passing the same upwardly, in admixture with the reactant stream effluent, into the lower portion of a center reactant stream conduit, and flowing said mixture laterally through a second annular-form catalyst bed in which the catalyst particles are movable via gravity-flow; and,

d. withdrawing the resulting converted reactant stream from an upper portion of said second annular-form catalyst bed.

3,882,016
FLOTATION MACHINE AND IMPELLER THEREFOR

Charles A. Green, Apartado 82, Chihuahua, Parral, Mexico

Continuation-in-part of Ser. No. 430,073, Jan. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 301,883, Oct. 30, 1972, Pat. No. 3,843,101. This application June 17, 1974, Ser. No. 479,749
Int. Cl. B03d *1/14*
U.S. Cl. 209—169 14 Claims

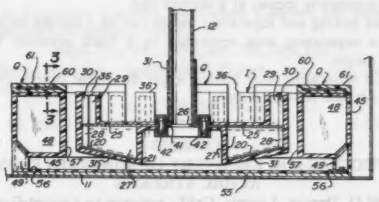
1. A rotatable impeller for a flotation machine having a tank, comprising:

a circular lower plate;

a circular upper plate concentric with and spaced from said lower plate, said plates each having a circular central opening therein;

a series of vanes extending generally radially and disposed between said plates, said vanes being constructed and arranged to pump pulp and the like from said central opening of said first plate and discharge the same from the periphery of the space between said plates;

a series of radial fingers spaced around the periphery of said upper plate and extending upwardly therefrom, said fingers having free upper ends and a radial extent less than that of said vanes; and

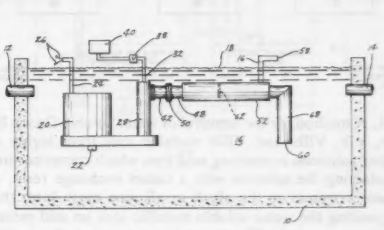


means connected to said lower plate at said central opening for supplying fluid under pressure to the underside of said impeller and for supporting said impeller above the bottom of said tank.

3,882,017
METHOD AND APPARATUS FOR AERATION OF BIODEGRADABLE WASTE MATERIAL

Norman R. Wittrup, Lakewood, Colo., assignor to Ren Vand, Inc., Webster City, Iowa

Filed Apr. 10, 1974, Ser. No. 459,847
Int. Cl. C02b *3/08*; C02c *1/12*
U.S. Cl. 210—15 14 Claims



1. A method of pressure aeration of biodegradable waste material to enhance the rate of degradation by aerobic bacteria present in the waste material, said method comprising:

introducing under conditions of high velocity a waste material slurry taken from a reservoir of biodegradable waste material into a confining zone to create a pressure greater than atmospheric, and to create high velocity turbulent flow,

introducing air under pressure into said confining zone to further increase turbulence therein and to provide an aerated slurry,

withdrawing the aerated slurry from said confining zone, and introducing said aerated slurry into a mixing and separating zone, having a mixing area and a separating area with said mixing area separated from said separating area by a back pressure creating means, wherein further turbulent mixing occurs in said mixing area, and withdrawing from said separating area and discharging downstream of said back pressure creating means, excess air and undissolved gases from said separating area, and

discharging under conditions of high velocity said aerated slurry from said separating area into said reservoir of said waste material below the surface thereof.

9. A waste treatment system comprising:

a pump means to pump sewage material at high velocity,

a riser means in communication with said pump means to receive sewage material at high velocity from said pump, an air introduction means to introduce air under condi-

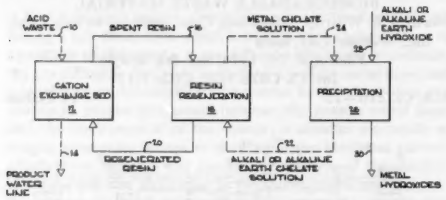
tions of pressure and turbulence into said riser means and to aerate sewage material within said riser means,
a conveying means,
a mixing and separating means,
said conveying means being in communication with said riser means
at a first end and in communication with said mixing and separating means at a second end,
said mixing and separating means having a mixing area and a separating area separated by a back pressure valve means,
said separating area having a gas discharge outlet and an aerated sewage outlet.

3,882,018

PROCESS FOR RECOVERY OF MINERALS FROM ACIDIC STREAMS

David O. Depree, Loomis, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Continuation-in-part of Ser. No. 95,252, Dec. 4, 1970, Pat. No. 3,725,259. This application Jan. 15, 1973, Ser. No. 323,500.
The portion of the term of this patent subsequent to Apr. 3, 1990, has been disclaimed.
Int. Cl. B01d *15/06*; **C02b** *1/76*
U.S. Cl. 210—20 **21 Claims**



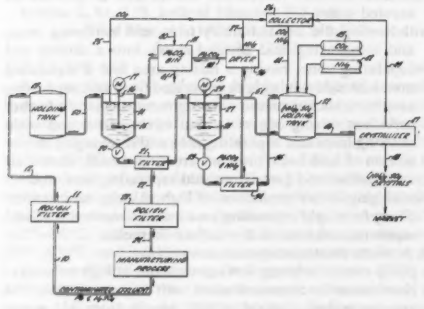
1. A method for the removal of water soluble Group Ib, IIb, Vb, VIb, VIIb, and VIIIb metallic ions from highly acidic water solutions containing said ions which comprises initially contacting the solution with a cation exchange resin, which resin is present as the alkali or alkaline earth form thereof, depositing the water soluble metallic ions on said resin, providing a neutral effluent, and regenerating the cation exchange resin by contacting same with a regenerating solvent solution of an alkali or alkaline earth chelate.

3,882,019

PROCESS FOR EFFLUENT WATER RECOVERY

Zane L. Burke, Whittier, Calif., assignor to Hill Brothers Chemical Co., Inc., City of Industry, Calif.

Filed Jan. 2, 1974, Ser. No. 430,060
Int. Cl. C02b *1/20*
U.S. Cl. 210—45 **15 Claims**



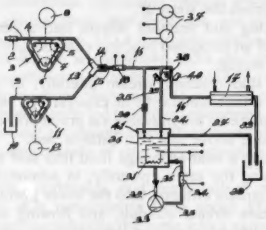
1. A process for converting effluent water, contaminated with lead and sulfuric acid as a result of a manufacturing process, into water suitable for reuse comprising the steps of:
adding lead carbonate to the effluent water in a first agitated enclosure in an amount approximately equal to or greater than the amount of total dissolved solids in said effluent water to form water, carbon dioxide, and insoluble lead sulfate;
filtering the contents of said first enclosure to separate the water from the lead sulfate;
conducting the filtered water back to the manufacturing process for reuse;
adding the filtered lead sulfate to a solution of ammonium sulfate, ammonia, carbon dioxide, and water in a second agitated enclosure in an amount sufficient to form ammonium sulfate and insoluble lead carbonate;
filtering the contents of said second enclosure to separate the ammonium sulfate solution from the lead carbonate;
conducting the filtered ammonium sulfate solution to a holding tank for reuse in said second enclosure; and
drying the filtered lead carbonate to remove residual ammonia therefrom.

3,882,020

CONCENTRATE DILUTER FOR PREPARING DIALYSIS LIQUID IN ARTIFICIAL KIDNEYS

Sergio Cere, Mirandola, Italy, assignor to Bellco S.p.A., Mirandola-Modena, Italy

Filed May 13, 1974, Ser. No. 469,573
Claims priority, application Italy, May 25, 1973, 3415/73
Int. Cl. B01d *31/00*
U.S. Cl. 210—85 **8 Claims**

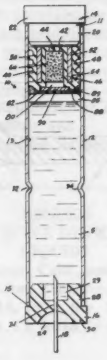


1. Concentrate diluter for preparing dialysis liquid in artificial kidneys, comprising a flexible duct for feeding water which has been previously degassed and heated to a predetermined temperature, and a flexible duct for feeding the concentrate, means for the peristaltic pumping of the degassed water and the concentrate along said ducts, a connector for said ducts arranged to mix the water with the concentrate and convey the preparation so obtained towards the dialyser through a duct along which is disposed a conductivity cell on which depend the means for regulating the dilution of concentrate in the degassed water, a container provided with an overflow and connected to the feed duct for the dialyser by a pair of ducts, one of which feeds a constant fraction of the preparation to the container, and a flow deviator arranged to block the flow of the preparation towards the dialyser, leaving simultaneously open the second of said pair of ducts or vice versa, there being also provided means for measuring the temperature and conductivity of the liquid in the container, and which govern said deviator.

3,882,021
SEALED ASSEMBLY FOR SEPARATION OF BLOOD WITH ANTI-RED CELL BARRIER

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,365
Int. Cl. B01d 33/00
U.S. Cl. 210—136 6 Claims



1. A self-contained fluid separator assembly capable of separating blood into its component phases of light phase plasma or serum and heavy phase cellular portion comprising:

a. a container having a first open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase and a second open end for removing the separated light phase;

b. closures sealing the open ends of the container, the closures being formed of a self-sealing elastomeric material which is penetrable by a cannula;

c. a piston having a specific gravity relatively greater than the heavy phase portion of the blood and slidably mounted in the container and having means on an outer surface in sealing engagement with an inner surface of the container;

d. pressure responsive valve means associated with said piston, said valve means being normally closed when there is a minimum of pressure differential on different portions of the valve means and which automatically opens in response to a substantial pressure differential so that when said container is subjected to moderate centrifugal force the blood separates into its light phase and heavy phase but the piston stays in the upper portion of the container, and subsequently when increased centrifugal force is used the valve means automatically opens with the lighht phase passing up through the valve means enabling the piston to move down through the light phase while retaining sealing engagement with the inner surfaces of the container;

e. frangible seal means in a position opposite to the first end for receiving blood and between said first end and said piston to isolate said piston from contact with the blood;

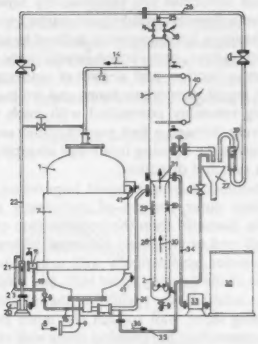
f. means for breaking said frangible seal, said seal and said means for breaking said seal being constructed and arranged so that when the centrifugal force reaches a predetermined value, the seal is broken by said seal breaking means; and

g. mechanical stop means on the container whereby the piston when moving through the light phase will stop a predetermined distance from one of the ends of the container followed by termination of the different pressure with permits the valve means to automatically shift from an open position to a closed position to provide an impervious barrier between the separated light phase and heavy phase of the blood.

3,882,022
APPARATUS FOR THE PERMUTATION OF MOVABLE BED FLUIDS

Pierre Lagoutte, Carraire du Grand Cabries, Le Tholonet (Bouches-du-Rhone), France

Filed Apr. 29, 1973, Ser. No. 353,191
Claims priority, application France, Apr. 20, 1972, 72.14938
Int. Cl. B01d 23/10
U.S. Cl. 210—189 5 Claims



1. An ion exchange plant for softening water comprising:

a. a softener tank, inlet means on the upper portion of said tank into which resins are supplied in their regenerated state, outlet means for removing the spent resins from the lower part of said tank, the circulation of the resins thus taking place from top to bottom, a vertical central distributor having a porous wall disposed in said tank, peripheral collector means disposed outside said tank opposite said distributor, fluid supply means for supplying a fluid to be treated in its crude state into said central distributor for radially outward passage through the thickness of the resin bed into the peripheral collector, conduit means for supplying a portion of said fluid through the lower part of said softener tank to carry along the spent resins;

b. a regeneration column for receiving spent resins and regenerating them by contact with a regeneration fluid, means for supplying said regeneration fluid to said regeneration column in a counterflow direction to the spent resins so that the regenerated resins come out of the upper part of said column; and

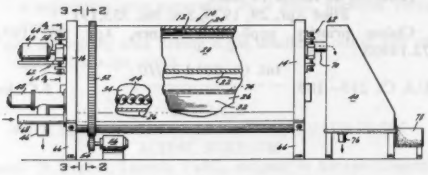
c. a rinsing column disposed above said regeneration column for receiving into the lower part thereof the resins coming from the regeneration column, said conduit means supplying a portion of the softened water to the upper portion of said rinsing column whereby the regenerated resins will be rinsed by the counterflowing water, and pipe means for returning the regenerated and rinsed resins from the upper portion of said rinsing column back to the upper portion of said softener tank.

3,882,023

APPARATUS FOR CONTINUOUSLY SEPARATING LIQUID AND SOLID FROM A LIQUID-SOLID MIXTURE

Vernon I. E. Wiegand, Sr., deceased, late of Cincinnati, Ohio, and by Florence Elliott Wiegand, executrix, 1943 Green Pine Dr., Cincinnati, Ohio 45231

Filed Nov. 21, 1972, Ser. No. 308,420
Int. Cl. B01d *17/00*
U.S. Cl. 210—294 **3 Claims**



1. Improved apparatus for continuously separating liquid and solid from a flowable solid-liquid mixture comprising:

a housing having a hollow interior defined by a liquid impervious, continuous, non-variant lateral inner wall of cylindrical cross section and a pair of end members each having a liquid impervious inner end wall;

the housing rotatably connected with each end member respectively through a first pair of liquid seal members;

means to rotate the housing inner wall about its longitudinal axis in a selected direction;

an inner member having a liquid impervious, continuous, non-variant outer surface of cylindrical cross section smaller in diameter than the cross section of the housing inner wall and unyieldingly mounted within the housing hollow interior, eccentrically with respect to the longitudinal axis of the housing inner wall, and having a longitudinal axis substantially parallel to the longitudinal axis of the housing inner wall so that the inner member outer surface approaches the housing inner wall at a horn angle across a substantially non yielding compression nip substantially parallel to the longitudinal axes of the housing inner wall and of the inner member;

the inner member extending between the end members and rotatably connected with each end member through a second pair of liquid seal members;

means to rotate the inner member about its longitudinal axis in the selected direction;

a baffle including first and second edges secured between the end members within the hollow interior and projecting between and biased to press the first and second edges into liquid sealing relationship with the inner member outer surface and with the housing inner wall thereby separating the housing hollow interior into a wet material section and a dried material section;

an inlet port through an end wall in the wet material section;

means to introduce the solid-liquid mixture into the wet material section through the inlet port;

a liquid outlet port through an end wall in the wet material section;

liquid filtering means connected with the liquid outlet port;

a dried material outlet port in an end wall in the dried material section; and

means to remove dried material from the dried material section through the dried material outlet port.

3,882,024

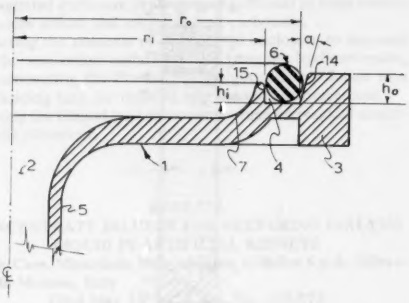
HEADER FOR STAGNATION-SENSITIVE LIQUIDS

George W. Holmes, Walnut Creek, and Charles E. Savage, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 19, 1974, Ser. No. 462,275
Int. Cl. B01d *33/00*
U.S. Cl. 210—321 **10 Claims**

1. A header having the general shape of a cup, pierced by at least one fluid passageway and having a generally cylindrical rim comprising outer and inner wall members, W_o and W_i, projecting generally parallel to the axis of the rim in a direction such as to increase the volume of fluid containable by the header and having concentric, opposed, generally cylindrical faces of greater and lesser radii, r_o and r_i, respectively, defining an annular land having a bottom width equal to $(r_o - r_i)$ and of greater and lesser heights, h_o and h_i, respectively,

said inner wall member W_i having a tapered cross section



and comprising a rounded uppermost portion having a thickness t_i measured along a radius through any point in the circle of juncture between the cylindrical and non-cylindrical surfaces of W_i,

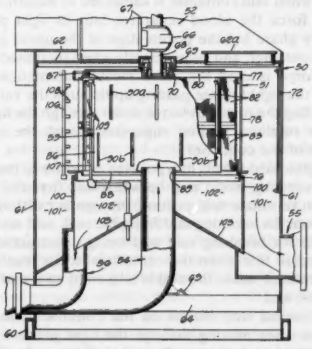
the ratio of h_o to $(r_o - r_i)$ being from about 0.6 to about 0.8, the ratio of h_i to $(r_o - r_i)$ being from about 0.45 to about 0.65 and the ratio of t_i to $(r_o - r_i)$ being from about 0.2 to about 0.3.

3,882,025

WASTEWATER CONCENTRATOR WITH SLOTTED DISTRIBUTOR

Walter J. Talley, Jr., Brentwood Park, Calif., assignor to Sweco, Inc., Los Angeles, Calif.

Filed June 16, 1972, Ser. No. 263,540
Int. Cl. B01d *33/06*
U.S. Cl. 210—354 **4 Claims**



1. Screen apparatus comprising

substantially cylindrical screening means for screening an influent applied thereto,

support means for supporting said screening means for rotation substantially about the axis of said screening means,

stationary distributor means disposed in said screening means for receiving influent and providing at least a stream of influent toward the inner surface of said screening means, said stationary distributor means imparting a velocity component to at least one said stream of influent which is tangential relative to said substantially cylindrical screening means in the direction of rotation of said substantially cylindrical screening means, said tangential velocity component providing the sole means for rotating said screening means said distributor means includes a peripheral wall, a top and a bottom thereby defining a substantially cylindrical enclosure, said peripheral wall being close to the inner surface of said screening means and having associated therewith the means for imparting the velocity component, and

feed means for supplying influent into said distributor means.

3,882,026

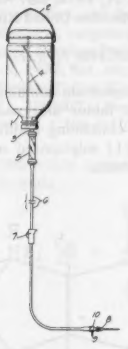
HYDROPHOBIC FILTER DEVICE FOR MEDICAL LIQUIDS

Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 14, 1972, Ser. No. 280,542

Int. Cl. B01d *35/02*

U.S. Cl. 210—446 **8 Claims**



1. A liquid filter assembly for filtering at parenteral solution head-pressures immediately at the site for administering the solution to a patient at flow rates used in conventional parenteral therapy comprising: an elongated hollow housing having a liquid inlet opening; a rigid tubular inlet adapter at one end surrounding the inlet opening for connecting the housing to a tubular administration set leading from an elevated parenteral liquid source; said housing having a liquid outlet opening spaced from the inlet opening; a rigid tubular outlet needle adapter in axial alignment with the inlet adapter and surrounding the outlet, said needle outlet adapter including a tapered annular surface for wedgingly connecting to a tapered annular surface hub of a venous needle for dispensing filtered liquid immediately at the needle site of a patient's anatomy; and a "depth" filter membrane of hydrophobic homogenous material with randomly communicating interconnected axially stacked passages of from 10 to 40 micron size and communicating between said liquid inlet opening and liquid outlet opening, said filter membrane fitting transversely inside the housing and peripherally sealed thereto between the liquid inlet and outlet openings whereby all liquid passing through the assembly must pass through the stacked passages, said housing includes at least one support prong on a downstream side of the filter membrane, said support prong having a rounded contact surface terminally engaging a central portion of the membrane, said membrane being relatively flexible and the prong absorbing shock of pressure surges to protect it from rupturing under a high pressure surge, said rounded prong contact surface covering less than 5 per cent of the effective filter area of the filter membrane when in contact therewith, said filter membrane being a porous normally hydrophobic structure impervious to at least 90 per cent of all particulate matter of 5 micron size and greater from a parenteral solution passing through its randomly interconnected 10 to 40 micron size passages, the filter membrane being from 0.003 and 0.016 inches thick and having an effective filter area equivalent to a 0.250 inch diameter disc, the housing including a central section which contains said filter membrane, said central section comprising essentially an axial projection between said adapters.

3,882,027

RANDOM PACKING MEDIUM

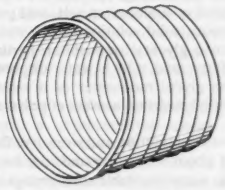
John Lunt, Alderley Edge, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 17, 1973, Ser. No. 352,037

Claims priority, application United Kingdom, Apr. 24, 1972, 18823/72

Int. Cl. B01d *39/16*

U.S. Cl. 210—500 **9 Claims**



1. A packing for biologically treating waste water in a percolating filter comprising randomly packed extruded hollow cylindrical pieces of an organic polymeric material, the wall of each cylindrical piece being provided, throughout its length, as a plurality of corrugations which lie in planes which are transverse to or oblique to the main axis of the cylindrical piece, each of said corrugations in the wall of each cylindrical corrugated piece having a depth in excess of the thickness of the wall.

3,882,028

MULTIPLE CHAMBER CHEMILUMINESCENT ANALYZER

William J. Zolner, Westford, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed May 17, 1974, Ser. No. 470,876

Int. Cl. G01n *21/22*

U.S. Cl. 250—361 **20 Claims**

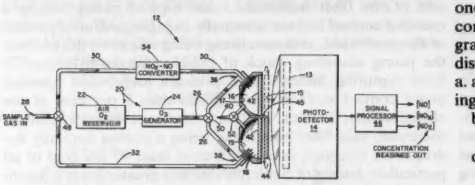
1. Apparatus for observing chemiluminescent reaction comprising:

a plurality of reaction chambers having optical openings therein;

concentric feed means for supplying reagents and samples to each of said reaction chambers;

a photodetector spatially arranged to observe sites of reaction in each of said chambers for detecting radiant energy given off as a result of chemiluminescent reaction in said chambers and for generating an output responsive to said detected energy; and

means periodically coupling and uncoupling radiant energy from each of said chambers to said photodetector for



forming in said output a sequence of discrete time-wise interlaced signals.

3,882,029

WELL COMPLETION AND WORKOVER FLUID

Paul W. Fischer, Whittier; David S. Pye, Brea, and Julius P. Gallus, Anaheim, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Sept. 29, 1972, Ser. No. 293,388

Int. Cl. E21b *21/04;* **C09k** *3/00*

U.S. Cl. 252—8.55 R **8 Claims**

1. An aqueous well completion and workover fluid comprising a dispersion of about 4 to 10 pounds per barrel of finely divided, oil-soluble, water-insoluble solid particles in an aqueous salt solution containing about 1 to 5 pounds per barrel of chrome lignite, about 0.1 to 2 pounds per barrel of xanthan gum, about 0.1 to 1 pound per barrel of hydroxyethyl cellulose, and at least about 1 weight percent of a water-soluble inorganic alkali metal or ammonium salt, said particles comprising a homogeneous solid solution of (1) wax, (2) an oil-soluble surface active glyceryl or sorbitan partial ester of a saturated higher fatty acid, (3) a water-dispersible surface active polyethylene glycol monoester of a saturated higher fatty acid, (4) an ethylene/vinyl acetate copolymer, and (5) a fatty alcohol.

7. An aqueous well completion and workover fluid comprising a dispersion of about 4 to 10 pounds per barrel of finely divided, oil-soluble, water-insoluble solid particles in an aqueous salt solution containing about 1 to 5 pounds per barrel of chrome lignite, about 0.1 to 2 pounds per barrel of xanthan gum; about 0.1 to 1 pound per barrel of a hydroxyethyl cellulose having about 1 to 3 moles of substituent ethylene oxide per anhydroglucose unit of the cellulose and that is characterized by a viscosity of about 1,500 to 5,000 centipoises for a 1 weight percent solution thereof; and at least about 1 weight percent of an alkali metal or ammonium halide or nitrate; said particles comprising a homogeneous solid solution of (1) about 45 to 55 weight percent of paraffin wax, (2) about 15 to 20 weight percent of glyceryl or sorbitan monostearate, (3) about 25 to 30 weight percent of polyethylene glycol monostearate, (4) about 1 to 4 weight percent of an ethylene/vinyl acetate copolymer containing about 10 to 30 weight percent vinyl acetate and exhibiting a Melt Index of less than 20 grams/10 minutes, and (5) a saturated fatty alcohol containing about 10 to 14 carbon atoms, said particles having average diameters in the range of about 0.1 to 50 microns.

3,882,030

SELF-LUBRICATING BEARING ELEMENTS

Mahlon E. Campbell, Overland Park, Kans., and William D. Walker, Independence, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1974, Ser. No. 443,083

Int. Cl. C10m *7/40, 7/06, 7/02*

U.S. Cl. 252—12 **10 Claims**

1. A self-lubricating polymeric composition consisting essentially of an arylene sulfide polymer and a solid lubricating component consisting of a mixture of molybdenum disulfide and antimony trioxide in a weight ratio of molybdenum disulfide to antimony trioxide ranging from 35:65 to 75:25.

5. A method of forming a solid self-lubricating composite consisting essentially of an arylene sulfide polymer and at least one solid lubricating component selected from the group consisting of molybdenum disulfide, molybdenum diselenide, graphite, antimony trioxide, tungsten disulfide, tungsten diselenide, and mixtures thereof which comprises the steps of:

a. admixing said polymer and at least one of said solid lubricating components;

b. heating the resulting admixture at a first temperature for a first interval;

c. thereafter heating said admixture at a second, higher temperature for a second interval;

d. thereafter cooling and grinding said thus-heated admixture;

e. compressing the thus-ground admixture of step (d) in a mold at a first pressure;

f. heating the thus-compressed composition at a third temperature for a third interval;

g. thereafter, molding the composition of step (f) at a second pressure;

h. cooling the thus-molded composition under said second pressure to a fourth temperature; and

i. thereafter removing from the mold the finished self-lubricating composite.

3,882,031

LUBRICANT COMPOSITIONS

Herbert Frank Askew; Gerald John Joseph. Jayne, and John Scotchford Elliott, all of Bracknell, England, assignors to Edwin Cooper & Company Limited, Bracknell, England

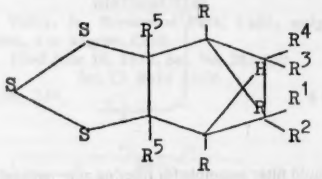
Filed Apr. 11, 1974, Ser. No. 459,938

Claims priority, application United Kingdom, Apr. 12, 1973, 17728/73

Int. Cl. C10m *1/38, 1/34, 3/32*

U.S. Cl. 252—45 **13 Claims**

1. A lubricating composition containing a major amount of lubricating oil and a minor anti-oxidant or load-carrying amount of a sulphur-containing additive selected from the group consisting of (1) sulphurised norborneyl compound having the general formula:



(A)

wherein:

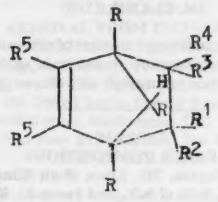
a. each of R, R^3 and R^4 when taken singly is selected from the group consisting of a hydrogen atom, an alkyl group containing from 1 to about 15 carbon atoms, an aryl group containing from 6 to about 15 carbon atoms and a cycloalkyl group containing from 4 to about 10 carbon atoms;

b. each of R^1 and R^2 when taken singly is selected from the group consisting of a hydrogen atom, an alkyl group containing from 1 to about 15 carbon atoms, an aryl group containing from 6 to about 15 carbon atoms, a cycloalkyl group containing from 4 to about 10 carbon atoms and an alkenyl group containing from 2 to about 10 carbon atoms;

c. R^1 and R^2 when taken together from the group —CHY-.CY = CY— in which Y is a hydrogen atom or a methyl group;

d. R^1 when taken together with R^2 forms an alkylidene group containing from 1 to about 6 carbon atoms; and

e. R^5 is selected from the group consisting of a hydrogen atom and an alkyl group containing from 1 to about 15 carbon atoms; and (2) an oil-soluble sulphurised norbornenyl product resulting from sulphurising a compound having the general formula:



(B)

wherein R, R^1, R^2, R^3, R^4 and R^5 are as hereinbefore defined at a temperature of up to 180°C., said sulphurisation being carried out in the absence of a solvent or in the presence of a non-polar solvent.

4. A lubricating composition according to claim 1 which incorporates a minor amount of benzotriazole therein.

3,882,032

SYNERGISTIC MIXTURE OF ADIAMINE AND ALKALIMETALAMIDE AS AN ANTIOXIDANT COMPOSITION AND LUBRICANTS CONTAINING SAME

Michael Gavin Bird, Weybridge, and Keith Aled Wyn Parry, Camberley, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Jan. 5, 1972, Ser. No. 215,646

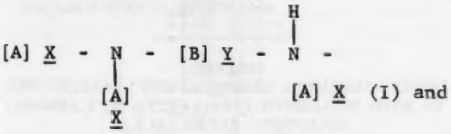
Claims priority, application United Kingdom, Jan. 18, 1971, 2350/71; Aug. 12, 1971, 37868/71; Sept. 7, 1971, 41589/71

Int. Cl. C10n *1/10*

U.S. Cl. 252—49.7 **14 Claims**

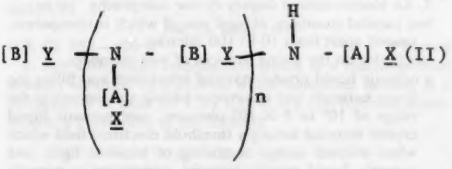
1. An antioxidant composition comprising

a. a diamine of the formula



(I) and

b. an alkali metal amide of an amine of the formula



(II)

where X is a benzene nucleus substituted in the para position to the nitrogen atom with a tertiary alkyl group having 4 to 9 carbon atoms and Y is selected from the group consisting of a benzene nucleus substituted in the para position with a tertiary alkyl group having 4 to 9 carbon atoms, an alpha naphthyl group and a beta naphthyl group, and *n* is 0, 1, or 2, the weight ratio of the diamine of Formula I to the alkali metal amide being 1:1 to 12:1.

3,882,033

SILICONE GREASE FOR SEMICONDUCTORS

John H. Wright, Elnora, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 160,163, July 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 764,999, Oct. 4, 1968, abandoned. This application Jan. 5, 1973, Ser. No. 321,388

Int. Cl. H01b *3/46*

U.S. Cl. 252—63.5 **9 Claims**

1. A silicone grease composition consisting essentially of on a weight basis:

1. from 15 to 97.9 percent of a polysiloxane fluid of the formula:

$$(R)_nSiO_{4-n/2}$$

where

R represents a member selected from the class consisting of alkyl radicals having from one to 22 carbon atoms, lower alkenyl radicals having two to eight carbon atoms, cycloalkyl radicals having from five to seven carbon atoms; mononuclear and binuclear aryl radicals; mononuclear aryl lower alkyl radicals; cyano lower alkyl radicals and up to 50 percent of the R radicals can also be hydrogen; and *n* has a value of from 0.002 to 3.0,

2. from 0.1 percent of a neutral, dielectric desiccant being at least one selected from the class consisting of anhydrous calcium sulfate and synthetic zeolites being at least one selected from the class consisting of:

$$0.95+0.25M_{2/m}O.Al_2O_3:2.175+0.825SiO_2:YH_2O$$

wherein

m represents at least one of the materials in the groups consisting of hydrogen, ammonium, metals in Groups I and II of the periodic table and the transition metals of the periodic table, *m* represents the valence of M, and *Y* may be any value up to about 6, and

$$0.9+0.2M'_{2/m}O:Al_2O_3:2.5+0.5SiO_2Y'H_2O$$

wherein

M′ represents at least one cation having a valence of not more than 3, *m′* represents the valence of M′, and *Y′* may be any value up to about 8, and

3. from 2 percent to 84.9 percent of a grease thickening agent being at least one selected from the class consisting of finely divided, non-conducting inert oxides of metallic and glass-metallic materials and inert organic thickening materials and mixtures thereof substantially free of interfering water.

3,882,034

SIMULTANEOUS FORMATION OF EXPANDING BORAX PARTICLES AND SPRAY DRIED DETERGENTS

Edward James Gibbons, Fanwood, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

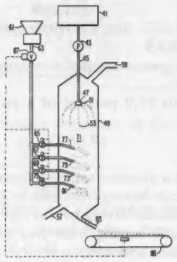
Division of Ser. No. 885,079, Dec. 15, 1969, abandoned. This application Feb. 11, 1974, Ser. No. 441,302

Int. Cl. C11d *3/04, 7/18, 11/02*

U.S. Cl. 252—99 **7 Claims**

1. A method for producing a non-stratifying, borax-containing detergent composition wherein the proportion of borax in the which comprises passing particles is from **10-50%** of feed hydrated borax having a particle size within the range of 20 to 200 mesh downwardly through a hot drying gas moving countercurrently at a speed of 0.05 to 5 ft./sec. in a drying zone defined by an enclosing wall, the temperature of said drying gas being from 120° to 600°C., the pressure in said drying zone ranging from atmospheric to 1 m.m. of mercury vacuum, the dwell time of said borax particles in the drying zone being from 0.1 to 10 seconds so that the temperature of the borax particles does not exceed 100°C., whereby to produce a product borax particles having a moisture content of 1 to 10% and a bulk density about 0.1 to 0.8 times the bulk density of the feed borax particles, concurrently spraying into said drying zone a detergent slurry at a point above the point

of introduction of the hydrated borax particles blending the spray dried particles of detergent composition with the parti-



cles of borax being decrepitated and removing the mixed detergent borax composition from the dehydrating zone.

3,882,035

IMINODIACETONITRILE DERIVATIVES AS PEROXYGEN BLEACH ACTIVATORS

Frank Fred Loffelman, Somerville, and Thomas Eugene Brady, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 21, 1973, Ser. No. 343,314
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 **13 Claims**

1. A bleaching composition comprising hydrogen peroxide or a hydrogen peroxide releasing compound of the group of organic peroxides and inorganic peroxygen salts and an activating amount of an iminodiacetonitrile compound represented by the formula:

$$A—N(CH_2CN)_2$$

wherein A is an acyl group selected from aroyl, substituted aroyl, lower alkanoyl and the residue of a heterocyclic carboxylic acid halide; or a 4,6-disubstituted-s-triazinyl group in which the substituent groups are selected from amino, diethylamino and bis(cyanomethyl)amino groups.

3,882,036

CONTACT LENS CLEANING AND STORING COMPOSITION INCLUDING NONIONIC SURFACTANT, BENZALKONIUM CHLORIDE AND Na_2EDTA

Joseph Z. Krezanoski, and John C. Petricciani, both of Los Altos, Calif., assignors to Flow Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 148,993, June 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 724,600, April 26, 1968, abandoned. This application Aug. 11, 1972, Ser. No. 279,800
Int. Cl. C11d *1/66, 3/48*
U.S. Cl. 252—106 **11 Claims**

1. A cleaning and storage solution for hard contact lenses consisting essentially of: from 0.002 to 0.2% of benzalkonium chloride for inhibiting microbial growth in the solution; from 0.01 to 2% trisodium ethylenediaminetetraacetate; from 0.1 to 10% of a physiologically-acceptable nonionic surfactant selected from the group consisting of polyoxyethylene fatty acid ethers, polyoxyethylene fatty acid esters, and polyoxypropylene-polyoxyethylene block polymers; and water.

3,882,037

STABILIZED BORANE-TETRAHYDROFURAN SOLUTIONS

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.

Filed Feb. 22, 1973, Ser. No. 334,642
Int. Cl. C01b *35/00*
U.S. Cl. 252—188 **15 Claims**

1. A method for stabilizing a solution of diborane in tetrahydrofuran which comprises incorporating in said solution an effective concentration of an alkyl, alicyclic, or cyclic sulfide.

3,882,038

CLEANER COMPOSITIONS

Eugene Thomas Clayton, Mt. Kisco; Ruth Elinor Johnston, Briarcliff Manor, both of N.Y., and James M. Rector, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 7, 1968, Ser. No. 735,169
Int. Cl. C11d *1/72, 3/44*
U.S. Cl. 252—164 **5 Claims**

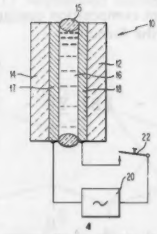
1. A cleaner composition consisting essentially of from about 1 to about 10 percent by weight of a monobutyl or monoamyl ether of propylene glycol, dipropylene glycol or tripropylene glycol; from about 0.01 to about 5 percent by weight of polyethoxylated linear long chain alcohol surfactant and from about 98.99 to about 85 percent by weight water wherein all percents are based on the total weight of the cleaner composition.

3,882,039

ADDITIVE FOR LIQUID CRYSTAL MATERIALS

Gerard J. Sprokel, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 21, 1973, Ser. No. 372,120
Int. Cl. C09k *3/00;* **G01n** *31/00, 33/00;* **G02f** *1/28, 1/36*
U.S. Cl. 252—299 **12 Claims**



7. An electro-optical display device comprising

two parallel members, at least one of which is transparent, spaced apart from 10 to 100 microns,

electrodes on the facing surfaces of said members,

a nematic liquid crystal material interposed and filling the space between said electrodes having a resistivity in the range of 10^8 to 5×10^9 ohm-cm., said nematic liquid crystal material having a threshold electrical field which when exerted causes scattering of incident light, said nematic liquid crystal material comprising a nematic material with a negative dielectric anisotropy having dissolved therein an additive to provide electrical conductivity having the formula $(R)_2(R_2)_2N^+X^-$ wherein R is a benzyl group, R_2 is selected from the group consisting of methyl and ethyl groups, and X^- is selected from the group consisting of Cl^-, Br^- and I^-, and

means for applying an electric field across the nematic liquid crystal material through said electrodes that exceeds said threshold electric field.

12. A nematic liquid crystal composition having an increased frequency response comprising

a nematic liquid crystal material with a negative dielectric anisotropy having dissolved therein choline chloride.

3,882,040

SILICON REMOVAL FROM INCINERATOR ASH BY REACTION WITH NOF.3HF

Robert G. Auge, and Robert P. DeGrazio, both of Boulder, Colo., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 21, 1973, Ser. No. 372,134

Int. Cl. G21c *11/42*

U.S. Cl. 252—301.1 W **5 Claims**

1. In the recovery of plutonium, americium, and the like, the method for removing silicon from ash containing silicon comprising contacting said ash with a solution containing from about .75 milliliters (ml) to about 1.0 ml of nitrosyl fluoride trihydrogen fluoride and from about 3.2 ml to about 5.0 ml of water for each gram of said ash, heating to from about 75°C to about 100°C, agitating while maintaining said temperature for from about 75 minutes to about 100 minutes to effect reaction of said nitrosyl fluoride trihydrogen fluoride with said silicon forming thereby silicon tetrafluoride gas, and removing said silicon tetrafluoride gas.

3,882,041

EUROPIUM-ACTIVATED ALKALINE-EARTH PYROPHOSPHATE PHOSPHORS

Martin Robert Royce, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 26, 1973, Ser. No. 401,030

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.4 P **6 Claims**

1. A phosphor whose empirical formula is

$$M^{+2}{}_3P_2O_7{:}aEu^{+2}{:}bR$$

wherein:

M is at least one of calcium, strontium, barium, and magnesium,

a equals 0.001 to 0.100 mole, and

b equals 0.00001 to 0.00020 mole.

3,882,042

ANTIOXIDANT COMPOSITION OF A REARRANGEMENT PRODUCT OF A TETRA-ARYL HYDRAZINE WITH AN ALKALI METAL COMPOUND

Brian McGuigan, Timperley; Richard John Dellar, Bolton, and William David Phillips, Poynton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

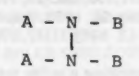
Filed Oct. 10, 1972, Ser. No. 296,454

Claims priority, application United Kingdom, Oct. 16, 1971, 48237/71

Int. Cl. B01j *1/16*

U.S. Cl. 252—400 R **8 Claims**

1. An antioxidant composition which is a rearrangement product obtained by a process which comprises heating at a temperature of from 80° C to 300° C in a non-oxidising atmosphere, a compound of the formula



in which A and B represent a phenyl group or a phenyl group substituted with one or more alkyl groups having one to 12 carbon atoms or a phenyl group substituted with one or more α, α-dimethyl benzyl groups, and combining the rearrangement product with from 0.01 to 1% of an alkali metal compound.

3,882,043

ANTIOXIDANT COMPOSITION OF A REARRANGEMENT PRODUCT OF A TETRA-ARYL HYDRAZINE AND A THIAZINE OR AMINE

Brian McGuigan, Timperley; Richard John Dellar, Bolton, and William David Phillips, Poynton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

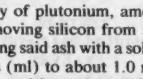
Filed Oct. 10, 1972, Ser. No. 296,452

Claims priority, application United Kingdom, Oct. 16, 1971, 48239/71

Int. Cl. B01j *1/16*

U.S. Cl. 252—402 **5 Claims**

1. An antioxidant composition obtained by a process which comprises heating at a temperature of from 80°C to 300°C in a non-oxidising atmosphere, a compound of the formula



in which A and B represent a phenyl group or phenyl groups substituted with one or more alkyl groups containing 1 to 12 carbon atoms or phenyl groups substituted with one or more α,α-dimethyl benzyl groups, in the presence of a radical acceptor selected from thiazines and amines in the ratio of from 0.25:1 to 2:1 of the radical acceptor to the above compound.

3,882,044

ANTIOXIDANT COMPOSITION OF A REARRANGEMENT PRODUCT OF A TETRA-ARYL HYDRAZINE AND SULFUR OR A SULFURIZING AGENT

Brian McGuigan, Timperley; Richard John Dellar, Bolton, and William David Phillips, Poynton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

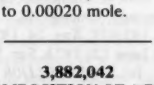
Filed Oct. 10, 1972, Ser. No. 296,453

Claims priority, application United Kingdom, Oct. 16, 1971, 48238/71

Int. Cl. B01j *1/16*

U.S. Cl. 252—402 **5 Claims**

1. An antioxidant composition obtained by a process which comprises heating at a temperature of from 80°C to 300°C in a non-oxidising atmosphere, a compound of the formula



in which A and B represent a phenyl group, a phenyl group substituted with one or more alkyl groups having 1 to 12 carbon atoms or with one or more α, α-dimethyl benzyl groups, and then heating the rearrangement product with 0.1 to 4 moles of sulphur or a sulphurising agent per mole of rearrangement product.

3,882,045

CATALYST COMPOSITION AND PRODUCTION OF 2,2-ICHLOROPROPIONIC ACID THEREWITH

Mike Mehdi Fooladi, Apt. 4-B, Oakmont Manor Apts., Vicksburg, Miss. 39180

Filed Feb. 28, 1974, Ser. No. 446,745

Int. Cl. B01j *11/74, 11/78*

U.S. Cl. 252—429 R **8 Claims**

1. A catalyst composition consisting essentially of a mixture of elemental iodine and at least one compound selected from the group consisting of a phosphorus halide and bis (dimethyl thio carbamoyl) disulfide wherein the catalyst may consist of 70 to 75% iodine and 20 to 25% of bis (dimethyl thio carbamoyl) disulfide or it may consist of one part of iodine and either from about 5 to about 100 parts phosphorus halide or a mixture of from 0.20 to 0.8 parts bis (dimethyl thio carbamoyl) disulfide and from about 5 to about 100 parts phosphorus halide.

3,882,046

CATALYST FOR POLYMERIZATION AND COPOLYMERIZATION OF OLEFINES AND A METHOD FOR PREPARING SAME

Anatoly Dmitrievich Pomogailo, ulitsa Pervaya, 33, kv. 15, Moskovskaya Oblast; Urakbai Alimbaevich Mambetov, ulitsa Abaya, 16, kv. 10, Guriev; Dmitry Vladimirovich Sokolsky, prospekt Abaya, 31, kv. 38, Alma-Ata; Alexandr Avraamovich Bolshov, ulitsa Ukrainskaya, 68 kv. 2, Guriev; Moisei Kharitonovich Gluzman, ulitsa Danilevskogo, 20, kv. 40, Kharkov; Gerta Gennadievna Kochurovskaya, ulitsa Bezdonnaya, 2, kv. 2, Kharkov; Evgeny Moiseevich Gluzman, ulitsa Danilevskogo, 20, kv. 40, Kharkov; Petr Evgenievich Matkovsky, ulitsa Pervaya, 16, kv. 26, Moskovskaya Oblast; Galina Albertovna Beikhold, Noginsky raion, p/o Chernogolovka, Obschezhitie, Moskovskaya Oblast; Irina Ivanovna Afanasieva, ulitsa Abaya, 7, kv. 10, Guriev; Mikhail Ivanovich Burymchenko, ulitsa 80/1, kv. 35, Odessa, and Esengeldy Baishiganov, ulitsa Abaya, 9, kv. 14, Guriev, all of U.S.S.R.

Filed Jan. 3, 1973, Ser. No. 320,710
Int. Cl. B01j *11/84*
U.S. Cl. 252—429 C **13 Claims**

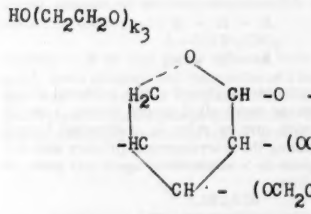
1. A catalyst for polymerization and copolymerization of olefins which is a binary system consisting of a complex compound having the general formula (D—O—MX_{n-1}), mMX_n, formed by the interaction between MX_n and D, where M is a metal of variable valency belonging to Groups IVA–VA of the periodic system, X is a halogen or an oxyhalogen, n is the number characterizing the valency of the M, m is a whole number from 1 to 50, and D is a modifying ligand of the electron-donor type selected from the group consisting of

a. polyglycolic ethers of monofunctional alcohols R—$(OCH_2CH_2)_k$—OH, where R is C_6H_{13}—C_9H_{19} and k is 3—9;

b. polyglycolic ethers of polyfunctional alcohols (R—$COOCH_2)_2$ C $[CH_2 (OCH_2CH_2)_k—OH]_2$ where R is C_4H_9—C_9H_{13} and k is 2.5–29

c. polyglycolic esters of carboxylic acids R—CO $(OCH_2CH_2)_k$ OH, where R is $C_{11}H_{23}$—$C_{17}H_{35}$ and k = 10–160

d. anhydrosorbitols of carboxylic acids



where $R = C_{11}H_{23} - C_{17}H_{35}$; $k_1 + k_2 + k_3 = 20–85$, in combination with an aluminum-organic compound having the general formula AlR_pY_{3-p} where R is a lower alkyl or isoalkyl, Y is chlorine or hydrogen and p is from 1 to 3.

3,882,047

OXIDATION CATALYST COMPOSITION OF UNSATURATED CARBOXYLIC ACID

Akihiko Niina; Kiyomori Qura, and Kuniyoshi Tashiro, all of Takaoka, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 309,962, Nov. 28, 1972, Pat. No. 3,795,703. This application Aug. 27, 1973, Ser. No. 391,668
Claims priority, application Japan, Nov. 30, 1971, 46-95949
Int. Cl. B01j *11/82*
U.S. Cl. 252—435 **4 Claims**

1. An oxidation catalyst composition for use in the vapor phase catalytic oxidation of unsaturated aldehydes selected from the group consisting of acrolein and methacrolein to a corresponding unsaturated carboxylic acid which consists essentially of a catalytic oxide of molybdenum, phosphorus, at least one element selected from the group consisting of thallium, rubidium, cesium, and potassium, and at least one element selected from the group consisting of chromium, silicon, aluminium, germanium and titanium, the catalytic oxide having the following formula

$$Mo_aP_bQ_cR_dO_e$$

wherein Q is at least one element selected from the group consisting of Tl, Rb, Cs and K; R is at least one element selected from the group consisting of Cr, Si, Al, Ge and Ti; and a, b, c, d and e each represent the number of atoms of each element; the atomic ratio of a:b:c:d is 1:1–0.01:1–0.01:2–0.01; and e is the number of oxygen atoms determined by the valence requirement of the other elements present.

3,882,048

SUPPORTED VANADIUM-PALLADIUM-CONTAINING CATALYST

Hermann Thelen; Kurt Halcour, both of Krefeld-Bockum; Wulf Schwerdtel, Leverkusen, and Wolfgang Swodenk, Odenthal-Globusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 4, 1973, Ser. No. 321,111
Claims priority, application Germany, Mar. 23, 1972, 2214056; Sept. 9, 1972, 2244401
Int. Cl. B01j *11/12*
U.S. Cl. 252—464 **4 Claims**

1. Supported catalyst comprising from about 0.1 to about 10 percent by weight of palladium and from about 0.1 to about 5 percent by weight of vanadium or a vanadium compound selected from the group consisting of inorganic vanadium salt and vanadium oxide supported on an alumina at least 20 percent of which has been converted into lithium-aluminum spinel.

3,882,049

CATALYST FOR HYDROTREATING PETROLEUM HYDROCARBON OILS AND CATALYST EMPLOYED THEREIN

Ralph J. Bertolacini, Chesterton; Paul Donald Hopkins, and Roland L. Menzl, both of Hammond, all of Ind., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 183,615, Aug. 24, 1971, abandoned. This application June 12, 1973, Ser. No. 369,402
Int. Cl. B01j *11/08*
U.S. Cl. 252—466 PT **4 Claims**

1. An improved catalytic composition for the hydrotreating of a petroleum hydrocarbon to produce a colorless mineral oil, which catalytic composition consists essentially of a Group VIII noble metal deposited upon a large-pore-diameter alumina having a surface area of about 200 square meters per gram to about 500 square meters per gram and an average pore diameter of about 120 A to about 200 A.

3,882,050

METHOD OF DEPOSITING A NOBLE METAL ON A SURFACE OF A NICKEL SUPPORT

Leonard R. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 211,730, Dec. 23, 1971, abandoned. This application July 24, 1973, Ser. No. 382,069
Int. Cl. B01j *11/12, 11/22*
U.S. Cl. 252—472 **1 Claim**

1. A method of depositing a noble metal on a surface of a nickel support, said method comprising contacting said surface of said nickel support with an aqueous solution of a palladium salt having a pH less than 7 until palladium deposition on said surface has substantially ceased;

subsequently contacting the surface thereby produced with nitric acid until said surface is activated, and thereafter

contacting the activated surface thereby produced with an aqueous solution of palladium salt, whereby additional palladium is deposited on said surface.

3,882,051
LIQUID DETERGENT COMPOSITION
Kenneth R. Hansen, Staten Island, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Division of Ser. No. 90,152, Nov. 16, 1970, Pat. No. 3,723,357. This application July 12, 1972, Ser. No. 271,195
Int. Cl. C11d 3/26
U.S. Cl. 252—545 4 Claims

1. A liquid detergent composition having enhanced foam stability which consists essentially of (I) 5 percent to 35 percent by weight of a water-soluble foaming detergent selected from the group consisting of N-alkyl amino carboxylates having the formula $R—N(H)C_2H_4COOM$, N-alkyl imino dicarboxylates having the formula $RN(C_2H_4COOM)_2$, alkyl sulfates having the formula $R(OC_2H_4)_mOSO_3M$, N-alkyl sulfobetaines having the formula $R—N(R_1)(R_2)(CH_2)_nSO_3$, C alkyl imidazolines and alkyl betaine detergents having the formula $Z(N)R_1R_2CH_2CO_2$ wherein R is an alkyl group of 10 to 16 carbon atoms, *m* is 0 to 5, R_1 and R_2 are C_1–C_3 alkyl or C_1–C_3 hydroxyalkyl, *n* is 1–3, Z is selected from the group consisting of R, $RC(O)NC_2H_4$ or $RC(O)NC_3H_6$, and M is selected from the group consisting of sodium, potassium, ammonium, and mono, di, and triethanolammonium; (II) 3 percent to 20 percent by weight of a water-soluble drainage-time extender having the formula $R—CH(OH)CH_2N(CH_2CH_2OH)_2$ wherein R is an alkyl group having from 8 to 16 carbon atoms; the sum of (I) and (II) being 10 per cent to 40 per cent by weight of the composition; the ratio of said detergent to drainage-time extender being in the range of from 9:1 to 1:1 and sufficient to improve foam stability; and (III) an aqueous vehicle.

3,882,052
ON-SITE GENERATION OF NON-FROTH POLYURETHANE FOAM
Robert J. Raynor, North Branford, and Wade T. Petroskey, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.
Filed Dec. 17, 1973, Ser. No. 425,597
Int. Cl. C08g 22/46
U.S. Cl. 260—2.5 BD 18 Claims

1. In a process for producing, by means of a portable foaming apparatus having a static mixer, a polyurethane foam from a reaction mixture comprised of a polyol, an organic isocyanate, a foaming agent and a reaction catalyst, the improvement of producing non-froth foam by blending into said mixture a sufficient proportion of an inert gas to bring about nucleation of said mixture, said inert gas having an atmospheric boiling point below about −80°C.

3,882,053
ANION EXCHANGE RESINS
Herbert Corte, Opladen; Harold Heller, Cologne, and Otto Netz, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft
Continuation of Ser. No. 313,534, Dec. 8, 1972, abandoned. This application July 1, 1974, Ser. No. 484,393
Claims priority, application Germany, Dec. 11, 1971, 2151628; Apr. 1, 1972, 2215956
Int. Cl. C08f 27/08
U.S. Cl. 260—2.1 E 15 Claims

1. A process for the preparation of a synthetic resin which has anion-exchanging properties which comprises condensing a crosslinked copolymer which contains aromatic nuclei and is a copolymer of at least one monovinyl compound and at least one polyvinyl compound, with at least one bis-(dicarbonimidomethyl)-ether in the presence of a catalytic amount of a Friedel-Crafts catalyst and hydrolyzing resulting condensation product.

3,882,054
METHOD FOR MANUFACTURING FLEXIBLE, VAPOR-PERMEABLE, HYDROLYSIS-STABLE POLYURETHANE ELASTOMERS AND THE PRODUCTS PRODUCED THEREFROM
Fritz Hostettler, Freehold, N.J., assignor to IPRC Corporation, Farmington, N.J.
Filed Feb. 6, 1973, Ser. No. 330,102
Int. Cl. C08g 22/44
U.S. Cl. 260—2.5 AY 6 Claims

1. A method for manufacturing flexible, vapor-permeable, hydrolysis-stable polyurethane elastomers which comprises:
a. distributing at least one finely-divided non-hygroscopic solid pore-forming material substantially uniformly throughout a hydrolysis-stable polyurethane forming reaction mixture, the pore-forming material being insoluble or only sparingly soluble in the polyurethane forming reaction mixture and inert with respect thereto and the polyurethane forming reaction mixture providing a polymerizate which is substantially free from solvent therefor;
b. reacting the polyurethane forming reaction mixture in a mold to provide a polymerizate of desired form, the polymerizate being unassociated with any substrate or support therefor when removed from the mold; and
c. leaching the polymerizate with a substance which dissolves or decomposes the pore-forming material but does not dissolve or significantly affect the polymerizate to provide a flexible, vapor-permeable, hydrolysis-stable polyurethane elastomer.

3,882,055
PROCESS OF PRODUCING FOAMS FROM UNSATURATED POLYESTERS
Gotz Koerner, Essen, and Gerd Rossmy, Essen-Werden, both of Germany, assignors to Th. Goldschmidt AG
Continuation-in-part of Ser. No. 201,103, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 836,987, June 26, 1969, Pat. No. 3,634,344. This application Apr. 4, 1973, Ser. No. 347,875
Claims priority, application France, July 4, 1968, 157859
Int. Cl. C08g 22/44, 53/10
U.S. Cl. 260—2.5 N 8 Claims

1. In a process of producing polyester foams on the basis of hardenable unsaturated polyesters in the presence of surface active foam stabilizers, the improvement which comprises using as foam stabilizer a polyoxyalkylene-polysiloxane mixed block polymer, said block polymer being characterized in that a. the polyoxyalkylene blocks of the polymer have an average mole weight of about between 500 to 3,000 and essentially consist of 40 to 100 percent by weight of ethylene oxide, the remainder being propylene oxide and/or higher alkylene oxides, with the proviso that when the proportion of ethylene oxide is 40–60 percent by weight, the molecular weight of the polyoxyalkylene blocks is > 2000, and
b. the polysiloxane blocks of the polymer contain on the average 3 to 35 silicon atoms of which 2 through 30 are present in the form of dimethylsiloxy groups while the remaining silicon atoms form trifunctional siloxy units.

3,882,056
SLIDE SWITCH ASSEMBLY WITH FIXED TERMINAL ARRAY PREVENTING GENERATION OF POP NOISES
Hiroyuki Nakasone, Tokyo, Japan, assignor to Toko Incorporated, Tokyo, Japan
Filed Nov. 8, 1973, Ser. No. 414,168
Claims priority, application Japan, Nov. 11, 1972, 47-113227
Int. Cl. H01h 15/08
U.S. Cl. 200—16 C 14 Claims

1. In a slide switch of the class comprising a hollow elongated casing, three juxtaposed main terminal members secured on the inner wall of said casing, a slide member adapted

to be reciprocated in said casing, and a first contact member carried by said slide member whereby the switching of a pair of circuits is effected by moving said slide member so as to cause said first contact member to bridge the center main terminal member and either one of the outer main terminal members, the improvement which comprises a pair of transition terminal members secured on the inner wall of said casing and a second contact member mounted on said slide member to cooperate with said transition terminal members, said three

main terminal members, said transition terminal members and said first and second contact members being positioned with respect to each other such that said transition terminal members and said second contact member cooperating therewith maintain a circuit in a closed state from an instant immediately prior to the disengagement of said first contact member from one of the outer main terminal members to an instant immediately after the engagement of said first contact member with the other outer main terminal member.

3,882,057

ADHESIVE COMPOSITION CONTAINING AS A BINDER A GRAFT POLYMER ON A WATER-SOLUBLE CELLULOSE ETHER OF AN UNSATURATED CARBOXYLIC ACID, ALKYL ACRYLATE AND VINYL ACETATE; AND PROCESS FOR PREPARING THE SAME

Sven Lindenfors, Domsjoverken, and Nils Johan Lundberg, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo, Ornskoldsvik, Sweden

Filed Aug. 29, 1973, Ser. No. 392,835

Claims priority, application Sweden, Sept. 14, 1972, 11878/72

Int. Cl. C08b *21/32*

U.S. Cl. 260—17 A **11 Claims**

1. An adhesive composition comprising as a binder a graft polymer of

a. an unsaturated carboxylic acid having the formula

$$R' - CH = \overset{R''}{\underset{|}{C}} - COOH$$

where R′ and R″ independently of each other are selected from the group consisting of hydrogen and alkyl groups having from one to two carbon atoms;

b. an alkyl acrylate having from one to eight carbon atoms in the alkyl; and

c. vinyl acetate;

graft polymerized on a graft polymer backbone of a water-soluble ether; the amount of unsaturated carboxylic acid being within the range from about 0.2 to 5 parts per part of cellulose ether; the amount of alkyl acrylate being within the range from about 0.2 to 5 parts per part of cellulose ether; and the amount of vinyl acetate being within the range from 0.2 to 5 parts per part of cellulose ether.

3,882,058

PHOTODEGRADABLE POLYMERIC COMPOSITIONS CONTAINING A MIXTURE OF AN IRON SALT AND SULFUR OR A DIALKYL POLYSULFIDE

Geneviève Le Brasseur, nee Nicoud, Bully-les-Mines, and Adrien Nicco, Bethune, both of France, assignors to Ethylene Plastique, Courbevoie, France

Filed Sept. 14, 1973, Ser. No. 397,272

Claims priority, application France, Sept. 20, 1972, 72.33361

Int. Cl. C08f *45/36, 45/46*

U.S. Cl. 260—23 H **3 Claims**

1. A photodegradable composition which comprises an admixture of (i) a polymer of a monoethylenically unsaturated hydrocarbon monomer, (ii) 10 to 200 mg per kg of the polymer of at least one iron salt selected from the group consisting of ferric naphthenate, a ferric salt of an aliphatic carboxylic acid of 2 to 22 carbon atoms and ferric salicylate and (iii) 10 to 1,000 mg of an additive selected from the group consisting of sulphur and dialkyl polysulphides per kg of the polymer.

3,882,059

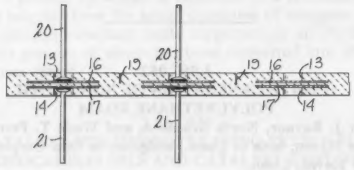
METHOD OF MAKING CERAMIC CAPACITOR

Gilbert J. Elderbaum, Clinton, Conn., assignor to Technical Ceramics, Inc., Clinton, Conn.

Filed May 11, 1973, Ser. No. 359,229

Int. Cl. H01g *13/00*

U.S. Cl. 29—25.42 **14 Claims**



1. A method of making single layer capacitors in multiple which comprises providing a first thin flat sheet of ceramic greenware, defining a multiplicity of conductive patterns on either side thereof in alignment to form a multiplicity of opposed individual capacitors, providing second and third sheets, laminating said second and third sheets to either side of said first sheet, thereafter scoring said lamination to define individual capacitors between but not extending to said score marks, firing said laminations to produce a cured ceramic assembly of a multiplicity of single layer capacitors, and thereafter breaking capacitors from said assembly along the score marks.

3,882,060

OIL RESISTANT RUBBER COMPOSITION

Raymond L. Guzy, Morton Grove, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 14, 1973, Ser. No. 415,572

Int. Cl. C08g *51/04, 51/08;* **E21b** *17/14*

U.S. Cl. 260—37 AL **3 Claims**

1. An epichlorohydrin homopolymer rubber composition capable of being cured and then capable of withstanding 4,000 psi pressure at 275°F. for at least 7 days with less than about 5% volume swell from brine exposure and less than about 5% volume change from oil exposure, said composition comprised of about 100 parts by weight of an epichlorohydrin homopolymer rubber having a molecular weight in excess of 200,000; about 1–2 parts by weight of nickel dibutyl dithiocarbamate; about 10–15 parts by weight of basic lead phosphite; about 1 part by weight phenothiazine; about 4–6 parts by weight of an aliphatic dicarboxylic acid; about 0.125 to 0.2 parts by weight of a dimethyl dithiocarbamate selected from

the group consisting of copper dimethyl dithiocarbamate and cadmium diethyl dithiocarbamate; about 1–2 parts by weight of an imidazole; and from about 10 to about 50 parts by weight of a filler selected from the group consisting of silica and carbon black.

3,882,061

METHOD OF MANUFACTURING AN ARTIFICIAL PAPER

Walter Bontinck, Engelhoekstraat, 30, 9852 Saint Martens-Leerne, and Willy De Coster, Mageleinstraat, 15, 9000 Gent, both of Belgium, assignors to UCB, Societe Anonyme

Division of Ser. No. 158,060, June 29, 1971. This application Dec. 27, 1973, Ser. No. 428,743

Claims priority, application Belgium, July 3, 1970, 752917

Int. Cl. C08f *29/12*, *45/04*

U.S. Cl. 260—23.7 M 8 Claims

1. A composition for the manufacture of artificial paper requiring neither calendering nor biorientation, which comprises

40 to 80 percent by weight of at least one rigid polyolefin (A) selected from the group consisting of homopolymers and copolymers of ethylene, propylene, and butylene, and also mixtures thereof, and having a melt index of at most 1 dg./min.;

5 to 30 percent by weight of at least one polymer (B) which is incompatible with the rigid polyolefin (A) and which when extruded by itself produces a brittle film which has a melt index lower than 10 dg./min., the polymer (B) being selected from the group consisting of homopolymers and copolymers containing a preponderant amount of styrene, an amount within the range of 20 to 25 percent by weight of a macromolecular material (C), said amount being sufficient to produce compatibility between (A) and (B), selected from the group consisting of copolymers of at least one monomer selected from the group consisting of ethylene, propylene, and butylene, and at least one monomer selected from the group consisting of isobutylene, butadiene, and isoprene, and said macromolecular material having a melt index of at most 2 dg./min.;

5 to 45 percent by weight of an inorganic filler (D) having a granulometry lower than 50 microns;

0 to 10 percent by weight of adjuvants (E) selected from the group consisting of antioxidizing agents, thermal stabilizers, optical bleaching agents, pigments, coloring materials, antistatic agents, and lubricants.

3,882,062

NOVEL PROCESSING AIDS FOR NATURAL AND SYNTHETIC RUBBER COMPOUNDS

Erwin Aron, Clifton, N.J., assignor to Technical Processing, Inc., Paterson, N.J.

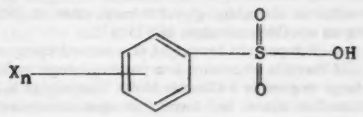
Continuation-in-part of Ser. No. 421,689, Dec. 4, 1973, which is a continuation-in-part of Ser. No. 411,975, Nov. 1, 1973, abandoned. This application Jan. 3, 1974, Ser. No. 430,566

Int. Cl. C08c *11/72*

U.S. Cl. 260—23.7 M 17 Claims

1. An improved rubber processing aid comprising:

a. an alkali or amine salt of an aromatic sulfonic acid having the general formula:



wherein X can be either hydrogen or branched or straight chain alkyl group having from 4 to 14 carbon atoms, and n has a value of from 1 to 5; and

b. a long chain fatty acid having a maximum of about 22 carbon atoms in the chain, wherein the amount by weight of said fatty acid present is at least equal to the amount by weight of said sulfonic acid salt, the improvement wherein said processing aid includes a thioether in an amount sufficient to catalyze the peptizing action of said salt.

3,882,063

METHOD OF PRODUCING UNIFORM FIBEROUS WEBS BY DRAWING PARTLY FUSED PARTICLES

Lam H. Gouw, Delft, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 184,561, Sept. 28, 1971, abandoned. This application June 4, 1973, Ser. No. 367,019

Claims priority, application United Kingdom, Oct. 1, 1970, 46766/70

Int. Cl. B29f *5/00*; B29c *17/02*

U.S. Cl. 264—24 11 Claims

1. The process for the manufacture of uniform fiberous webs which essentially consists of;

a. depositing particles of thermoplastic resin on a surface which is heated to a temperature and for a time sufficient to melt the particles to form a discontinuous sheet of partly fused particles, and

b. drawing the sheet of partly fused particles to spontaneously convert to a uniform fiberous web.

3,882,064

EPOXY RESIN POWDER COATING COMPOSITION

Walter Pregmon, Broomall, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

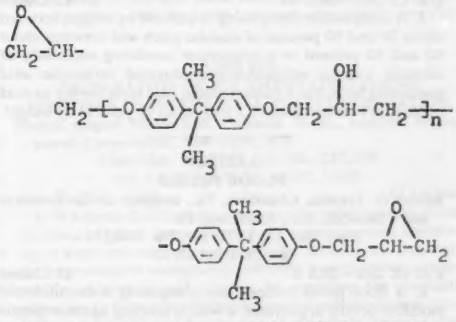
Filed Dec. 27, 1973, Ser. No. 428,724

Int. Cl. C08g *51/52*

U.S. Cl. 260—28 5 Claims

1. A powder coating composition comprising finely divided particles having a particle size of 1-100 microns; wherein the powder particles are an intimately mixed blend of a binder consisting essentially of

A. 72.6–90.0 percent by weight of an epoxy resin of the formula



wherein n is a positive integer sufficiently large to provide a Gardner Holdt Viscosity of R-V measured at 40 percent poly-

mer solids in diethylene glycol n-butyl ether at 25°C. and having an epoxide equivalent of 875–975;

B. 5.6–20.0 percent by weight of a second epoxy resin of said formula wherein n is a positive integer sufficiently large to provide a Gardner Holdt Viscosity of K-P measured as above and having an epoxide equivalent of 660–810;

C. 0.3–1.0 percent by weight of polyethylene wax having a molecular weight of 1000–3000;

D. 0.1–0.4 percent by weight of a catalyst of tri(dimethyl aminoethyl)phenol; and

E. 4.0–6.0 percent by weight of dicyandiamide.

3,882,065

HOT MELT ADHESIVES OF IMPROVED MELT VISCOSITY STABILITY

Austin Matthew Snow, Jr., Wilmington, Del., and Ronald Earl Uschold, Beaumont, Tex., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 346,832, April 2, 1973, abandoned. This application June 27, 1973, Ser. No. 373,914

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 B **17 Claims**

1. A hot melt adhesive composition comprising, in parts by weight, about:

1. 100 parts of petroleum wax;
2. 40 to 200 parts of a tackifying resin;
3. 15 to 100 parts of at least one of
   a. an elastomeric linear EPDM copolymer,
   b. an elastomeric branched copolymer of ethylene, at least one C_3 to C_{18} alpha-olefin, and at least one direactive nonconjugated diene, and
   c. an elastomeric branched copolymer of ethylene, at least one C_3 to C_{18} alpha-olefin, at least one direactive nonconjugated diene, and at least one monoreactive nonconjugated diene, said copolymer having a Mooney viscosity of about 10 to 70;
4. at least 2.2 parts of a boric additive per 100 parts of elastomeric copolymer; and
5. at least 2.2 parts of phenolic antioxidant per 100 parts of elastomeric copolymer;

said boric additive being at least one of boric acid, and boric anhydride.

3,882,066

ADHESIVE COMPOSITION COMPRISING COAL-TAR PITCH AND OLEFINIC COPOLYMERS

Wayne E. Smith, Jr., Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 714,456, March 20, 1968, abandoned. This application Apr. 30, 1971, Ser. No. 139,196

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 AS **12 Claims**

1. A composition comprising in percent by weight between about 20 and 50 percent of coal-tar pitch and between about 80 and 50 percent of a copolymer consisting essentially of ethylene and an ethylenically-unsaturated carboxylic acid containing from 3 to 8 carbon atoms, said resin having an acid content of between about 0.1 and about 75 percent by weight.

3,882,067

FLOOR POLISH

Robert G. Petrella, Glenolden, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 17, 1971, Ser. No. 144,254

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 R **12 Claims**

1. A floor polish composition comprising a crosslinkable modified acrylic copolymer, a wax, a leveling agent, a plasticizer, a coalescent and a fluorochemical, wherein the fluorochemical is selected from the group consisting of an amine salt of a fluorinated cyclic hexyl carbinol reacted with phosphorus pentoxide and an amine salt of undecafluorocyclohexane carbinol acrylate-methacrylic acid copolymer.

3,882,068

SIZING COMPOSITION FOR GLASS FIBERS OF POLYPROPYLENE EMULSION AND SILANE COUPLING AGENT

Paul Russel Swartz, Perrysburg, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Dec. 1, 1972, Ser. No. 311,065

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 XA **1 Claim**

1. A sizing composition for glass fibers used for reinforcing thermoplastic resin systems which consists of, in weight percent based on the composition:

2 to 30 percent polypropylene emulsion film former having a solids content of about 30 percent;

0.01 to 2.5 percent silane coupling agent; and the balance being water.

3,882,069

STABILIZED DISPERSIONS OF CHLOROPRENE POLYMERS

Edward M. Banta, Baytown, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Aug. 21, 1972, Ser. No. 282,429

Int. Cl. C08d *7/10, 7/18;* **C07c** *141/00*

U.S. Cl. 260—29.7 SQ **7 Claims**

1. A stable aqueous dispersion of a polymer of chloro-2-butadiene-1,3 comprising said polymer and a stabilizing agent selected from the group consisting of ammonium salts of alkyl ethoxylate sulfates and sodium and ammonium salts of sulfated alkyl phenoxy poly (ethyleneoxy) ethanol.

3,882,070

PERSULFATE STABILIZED LATICES

Gary W. Ceska, Coraopolis, Pa., assignor to Arco Polymers, Inc., Glenolden, Pa.

Filed May 23, 1973, Ser. No. 363,252

Int. Cl. C08d *1/22;* **C08g** *53/18*

U.S. Cl. 260—29.7 T **4 Claims**

1. A process for preparing surfactant-free latex from a total monomeric mixture comprising 30–80 parts per 100 parts of mixture of a conjugated diolefin, 20–70 parts per 100 parts of mixture of aryl vinyl monomer, and 0–10 parts per 100 parts of mixture of one or more monomers copolymerizable therewith, said process comprising:

a. forming an aqueous acidic emulsion of about 30–50 percent by weight of the monomeric mixture in water containing 0.4 to 1.5 parts of a persulfate polymerization initiator and 0.5 to 2.0 parts of N-methylolacrylamide per 100 parts of monomer; said water being used in an amount such that the total solids content of the resulting latex will be 20–30 percent;

b. polymerizing said aqueous acidic emulsion at a temperature of 50°–100° C. to essentially complete conversion to form a latex;

c. adding to said latex the remaining 50–70 percent by weight portion of the monomer mixture, an additional 0.4 to 1.5 parts of persulfate initiator, and 0.5 – 2.0 parts of N-methylolacrylamide per 100 parts of monomer; and

d. polymerizing the resulting mixture in aqueous emulsion at a temperature of 50°–100° C. to complete conversion to form a latex having from 35–55 percent solids, said latex being stable to mechanical shear and multivalent cations at pH 2.0 – 6.0.

3,882,071

RAPID SETTING NON-ELASTOMERIC POLYURETHANE COMPOSITIONS PREPARED IN THE PRESENCE OF AN ORGANIC PHOSPHATE, PHOSPHITE OR PHOSPHONATE

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,835, June 4, 1973, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,464

Int. Cl. C08g *22/04*

U.S. Cl. 260—30.6 R **31 Claims**

1. A non-elastomeric, non-cellular, solid polymer having a density of at least about 1 gram/cc and an elongation value of less than about 80 percent resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230,

B. an organic polyisocyanate,

C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of organic phosphates, organic phosphites and organic phosphonates and mixtures thereof, and

D. a non-amine-containing catalyst for urethane formation, which is an organo metal compound;

wherein components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, component (C) is present in quantities of from about 20 to about 50 percent with the proviso that when component (B) is an NCO-containing prepolymer containing less than aobut 40 percent NCO groups by weight, component (C) is present in quantities of from about 10 to about 50 percent by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.01 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes, without the application of an external source of heat, after admixture of said composition.

3,882,072

RAPID SETTING NON-ELASTOMERIC POLYURETHANE COMPOSITIONS PREPARED IN THE PRESENCE OF NON-HYDROXYL CONTAINING POLYOXYALKYLENE COMPOUNDS

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,385, June 4, 1973, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,369

Int. Cl. C08g *22/04*

U.S. Cl. 260—33.2 R **19 Claims**

1. A non-elastomeric, non-cellular solid polymer having a density of at least about 1 gram/cc and a percent elongation of less than about 80, resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230,

B. an organic polyisocyanate,

C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of non-hydroxyl-containing polyoxyalkylene compounds and mixtures thereof, and

D. a non-amine-containing catalyst for urethane formation, which is an organo metal compound;

wherein components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, component (C) is present in quantities of from about 20 to about 50% with the proviso that when component (B) is an NCO-containing prepolymer containing less than about 40% NCO by weight, component (C) is present in quantities of from about 10% to about 50% by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.2 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes, without the application of an external source of heat, after admixture of said composition.

3,882,073

THERMOSETTING COMPOSITIONS CONTAINING POLY(ARYLACETYLENES)

Lawrence C. Cessna, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 18, 1972, Ser. No. 316,332

Int. Cl. C08f *45/28, 45/44, 45/48*

U.S. Cl. 260—33.6 UA **15 Claims**

1. A thermosetting composition comprising a blend of (1) a prepolymer of at least one polyacetylenically substituted aromatic compound, said prepolymer having a number average molecular weight from about 900 to about 12,000, a ratio of aromatic protons to olefinic protons greater than about 2.4 and containing from about 5 to about 20% acetylenic groups by weight of the prepolymer, with (2) from about 2 to about 200%, by weight of the prepolymer, of at least one aromatic organic compound containing at least two six-membered aromatic rings, said rings being condensed with each other or coupled with each other directly or through a methylene, dimethylmethylene, ethylene or vinylene group, said compound or mixtures thereof containing no crystalline organic phase at 220°C., having a viscosity of less than 20 centipoises at 220°C. and containing no more than 5% of material volatile at 240°C.

3,882,074

PROCESS FOR THE PREPARATION OF POLYVINYL CHLORIDE MOULDING COMPOSITIONS

Antoine Di Settembrini, 4 Avenue Alfred de Vingy, Soisy-sous-Montmorency, France

Filed July 19, 1972, Ser. No. 273,124

Claims priority, application France, July 22, 1971, 71.26905

Int. Cl. C08f *29/24, 47/00;* **C08d** *9/08*

U.S. Cl. 260—34.2 **6 Claims**

1. Process for preparing an improved powdered polyvinyl chloride (PVC) composition capable of being shaped on heating, said composition comprising a PVC base, and additives including at least one anti-shock additive, lubricants and stabilizers, said process comprising:

a. pre-mixing in the dry stage said anti-shock additive, in the form of a powder, with said lubricant and stabilizer additives at a temperature in the range of 40° to 120°C, to form a premixture,

b. cooling the dry pre-mixture obtained in step (a),

c. mixing, in the cold state, said PVC base, in the form of a powder, with the cooled mixture obtained in step (b).

3,882,075

PREPARATION OF POLYMERS CONTAINING ADDITIVES BY INTERFACIAL POLYCONDENSATION

Rudolf August Victor Raff, Pullman, Wash., assignor to Research Corporation, New York, N.Y.

Filed Mar. 24, 1972, Ser. No. 237,878

Int. Cl. C08g *69/04, 63/18, 18/08*

U.S. Cl. 260—37 N **12 Claims**

1. In a method of forming a polymer by condensation at the interface of plural immiscible solvent solutions, each containing at least one monomer requisite for forming the polymer, the improvement comprising uniformly incorporating a compatible additive in said polymer by providing the reactants necessary to form the additive under the polymerization conditions separately in the monomer solutions whereby the

additive is formed in situ with and uniformly dispersed in the polymer at the interface.

3,882,076

METHOD FOR IMPROVING FLAME RETARDANCY OF POLYAMIDE COMPOSITIONS AND RESULTANT PRODUCT

Theodore Largman, Morris Twp.; Leon J. Schmehl, Lincoln Park, both of N.J., and Herman Stone, Andover, Mass., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 15, 1973, Ser. No. 341,632

Int. Cl. C09k *3/28*

U.S. Cl. 260—37 N **16 Claims**

1. A method of increasing the flame retardancy of a polyamide composition comprising a polycarbonamide having recurring —CONH— groups along the polymer chain and an effective amount of red or black phosphorus as a flame retardant additive which comprises heating said polyamide composition in the presence of molecular oxygen to a temperature of at least about 100°C for at least about 5 days.

3,882,077

PROCESS FOR PREPARING CARBON FIBER-REINFORCED POLYAMIDE RESINS

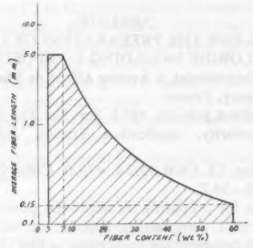
Hitoshi Takita, Tokyo, and Katsuo Take, Otsu, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan and Kureha Chemical Industry Co., Nihonbashi, Japan

Filed Oct. 23, 1973, Ser. No. 408,880

Claims priority, application Japan, Oct. 23, 1972, 47-105324

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 N **4 Claims**



1. A process for preparing a carbon fiber-reinforced polyamide resin which comprises incorporating carbon fibers of about 0.1 to 5mm in average length into the polymerization system of monomeric components capable of forming a polyamide resin prior to or in the course of the polymerization and then accomplishing the polymerization, said carbon fibers being incorporated in an amount of about 3 to 60% by weight of the total weight of the monomeric components and the carbon fibers, and the relationship between the amount of the carbon fibers to be incorporated and the average length of the carbon fibers to fall within the hatched area of FIG. 1 in the accompanying drawings.

3,882,078

FIBER REINFORCED POLYESTER RESIN HAVING A LOW SURFACE PROFILE AND IMPROVED IMPACT STRENGTH

Hideo Kubota, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1973, Ser. No. 424,574

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R **4 Claims**

1. A fiber reinforced molded article formed by heating under pressure a mixture comprising by weight:

25 to 60 parts of an unsaturated polyester formed from a linear aliphatic alpha, beta-unsaturated dicarboxylic acid and/or anhydride having from four to six carbon atoms and a polyhydric alcohol, said polyester having an acid number of from 5 to 40; and

5 to 20 parts of a polymer composition consisting of, by weight, 0 to 50 parts of a thermoplastic polymer having a glass transition temperature above 30° C. and 50 to 100 parts of an ABA type block copolymer having A and B segments with said A segments being repeating mer units of a material which if homopolymerized would produce a rigid thermoplastic polymer having a glass transition temperature above 30° C. and said B segments being repeating mer units of a material which if homopolymerized would produce a flexible elastomeric polymer having a glass transition temperature below 10° C.; and

40 to 60 parts of a monomeric copolymerizable diluent selected from the group consisting of tertiary butyl styrene, and mixtures comprising at least 50% by volume tertiary butyl styrene and the balance of a said mixture being any of styrene, monochlorostyrene, or vinyl toluene, and

50 to 100 parts of a fibrous reinforcement filler; and

100 to 180 parts of a mineral filler, said polyester and said polymer composition being initially uniformly dispersed in said diluent.

3,882,079

METHOD FOR PREPARING PIGMENTED POLYETHYLENE TEREPHTHALATE

Terence E. Winters, Mogadore, and Andrew P. Venditto, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 327,373, Jan. 29, 1973, abandoned. This application Jan. 14, 1974, Ser. No. 432,914

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 P **2 Claims**

1. In a process for incorporating from 0.01 to 3.0 weight percent of a pigment into polymerizing polyethylene terephthalate prepared by reacting terephthalic acid with ethylene glycol under esterification conditions to give an esterification product and then polymerizing the esterification product under conditions of reduced pressure and elevated temperature with the elimination of glycol the improvement which comprises adding said pigment, to said polymerizing esterification product at a point in the polymerization of said esterification product when the reduced pressure ranges from 100 to 0.1 millimeters of mercury pressure and the elevated temperature ranges from 245° to 285° C. and wherein said pigment is added to said polymerizing esterification product in the form of a pigmented polyethylene terephthalate masterbatch said masterbatch being prepared by adding a pigment/ethylene glycol slurry to a transesterification reaction mixture of dimethyl terephthalate and ethylene glycol or the transesterification product thereof and then polymerizing said transesterification reaction product.

3,882,080

SELF-HARDENING COMPOUND, PARTICULARLY FOR DENTAL-MEDICAL APPLICATION

Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, and Wolf-Dieter Zahler, both of Hechendorf, all of Germany, assignors to Espe Fabrik Pharmazeutischer Preparate GmbH, Seefeld, Oberbay, Germany

Continuation-in-part of Ser. No. 215,139, Jan. 3, 1972, Pat. No. 3,804,794. This application Feb. 26, 1974, Ser. No. 445,827

Claims priority, application Germany, Jan. 15, 1971, 2101939

Int. Cl. C08f *45/04*

U.S. Cl. 260—42.29 **7 Claims**

1. A pre-mixed dental preparation for the preparation of a self-hardening composition when mixed with water consisting

essentially of zinc oxide and a polymer of an unsaturated alpha, beta-dicarboxylic acid selected from the group consisting of homopolymers of unsaturated alpha, beta-dicarboxylic acids of four to five carbon atoms and copolymers of said acids with each other and with less than 10 mol percent of an unsaturated monocarboxylic acid, acrylamide, methacrylic ester or methacrylic amide wherein the weight ratio of zinc oxide to said polymer is 20:1 to 0.6:1.

3,882,081

PROCESS FOR STABILIZING VINYLIDENE CHLORIDE POLYMERS AGAINST METAL-INDUCED DEGRADATION

Alvin W. Baker, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 262,693, June 14, 1972, abandoned. This application Oct. 3, 1973, Ser. No. 403,148

Int. Cl. C08f *45/56, 45/58*

U.S. Cl. 260—45.75 V **3 Claims**

1. In the process of stabilizing vinylidene chloride polymer against metal-induced degradation, the improvement consisting of admixing with said vinylidene chloride polymer (1) from about 0.2 to about 2 percent by polymer weight of dibasic lead phosphite and (2) from about 0.2 to about 2 percent by polymer weight of 1,4-benzoquinone.

3,882,082

STABILIZATION OF PROPYLENE POLYMERS

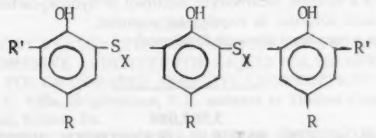
Michael Robin, Colonia, N.J., and Sheldon R. Schulte, Columbus, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 8, 1972, Ser. No. 251,165

Int. Cl. C08f *45/58;* **C08g** *51/58*

U.S. Cl. 260—45.95 C **15 Claims**

1. A polymer composition of increased stability against oxidative degradation comprising a propylene polymer having an effective stabilizing amount of compound of the general formula:



wherein *x* is an integer of from 1 to 2, R′ is tertiary butyl and each R individually is an alkyl radical of 1–4 carbon atoms.

3,882,083

LATENT ADDITION CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Abe Berger, Schenectady, and Bruce Bertolette Hardman, Mechanicville, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Nov. 21, 1973, Ser. No. 417,786

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 UA **15 Claims**

1. A latent curable composition stabilized against premature gelation comprising:

a. an olefinorganopolysiloxane having units of the structural formula

$$R_aR'_bSiO_{4-a-b/2}$$

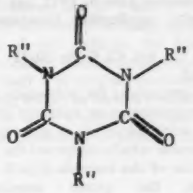
b. an organohydrogenpolysiloxane having units of the structural formula

$$R_cSiH_dSiO_{4-c-d/2}$$

wherein R is selected from the group consisting of a monovalent hydrocarbon radical, a halogenated monovalent hydrocarbon radical, a cyanoalkyl radical and mixtures thereof, R′ is an olefinic hydrocarbon radical, wherein *a* has a value of from 0 to 3, inclusive, *b* has a value of from 0.005 to 2.0, inclusive, and the sum of *a* and *b* is equal to from 0.8 to 3, inclusive,

c. a sufficient amount of a platinum catalyst to cause the co-reaction of (a) and (b) and

d. an ethylenically unsaturated isocyanurate corresponding to the structural formula



wherein R″ is the same or different and is selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, polynuclear aryl, heteroaryl, monofunctional lower-alkenyl and non-interfering substituted derivatives thereof with the proviso that at least one R″ is lower-alkenyl, said ethylenically unsaturated isocyanurate being present in an amount sufficient to inhibit premature gelation but insufficient to prevent cure at elevated temperature.

3,882,084

OPTICALLY CROSS-LINKABLE POLYMER

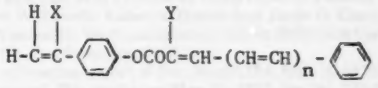
Masao Tato, Yokohama; Masaki Hasegawa, Tokyo, and Taro Ichijyo, Kamakura, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 46,836, June 16, 1970, abandoned. This application June 8, 1972, Ser. No. 272,930

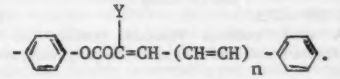
Int. Cl. C08f *3/42, 15/02*

U.S. Cl. 260—47 UA **4 Claims**

1. A photosensitive homopolymer having a chain formed by polymerizing the CH_2=CX group of a monomer of the formula



wherein X is H or a lower alkyl, Y is one member selected from the group consisting of H and CN group, *n* is 0 or 1, and the phenyl in the styrylacrylic acid group or cinnamic acid group is one member selected from the group consisting of unsubstituted groups, substituents of chlorine, fluorine, nitro group, cyano group, methoxy group, and methyl group which are inactive to phenolic hydroxy group and carboxylic acid-chlorides, said homopolymer having repetitive units each having the formula



3,882,085
POLYAMIDE POLYMERS FROM AMINO POLYAMIDE REACTANTS

Karl Schmitt, Herne; Fritz Gude, Wanne-Eickel, and Siegfried Brandt, Herne, all of Germany, assignors to Veba Chemie Aktiengesellschaft, Wanne-Eickel, Germany

Continuation of Ser. No. 24,854, April 1, 1970, abandoned. This application June 5, 1972, Ser. No. 259,643

Claims priority, application Germany, Apr. 3, 1969, 1917274

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 **4 Claims**

1. Polyamide-precursors for polyamide polymers, the precursors being condensates or mixtures of condensates of a tetracarboxylic acid, anhydride or ester thereof with at least one aminopolyamide which comprises the condensate of $n+1$ mols of a diamine of the formula $H_2N\text{-}R\text{-}NH_2$, said diamine selected from the group consisting of 2,2,4-trimethylhexamethylene diamine, 2,4,4-trimethylhexamethylene diamine and 1-amino-3-aminomethyl-3,5,5-trimethylcyclohexane with n mols of at least one acid selected from the group consisting of a dicarboxylic acid and an amino acid.

3,882,086
POLYMERS FROM HYDRAZINE AND TRICARBOXYLIC ACID ANHYDRIDES

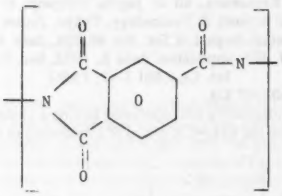
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 13, 1973, Ser. No. 369,629

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 **4 Claims**

1. An organic condensation polymer consisting essentially of the reaction product of a benzenetricarboxylic monoanhydride and hydrazine, being further characterized by the repeating structural formula:



3,882,087
ORGANIC PHOTOCONDUCTIVE MATERIAL

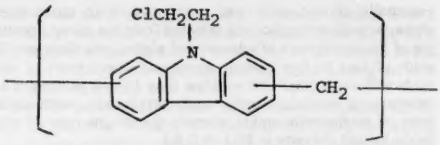
Syu Watarai, Tokyo, and Hisatake Ono, Asaka, both of Japan, assignors to Rank Xerox, Ltd., London, England

Division of Ser. No. 174,272, Aug. 23, 1971, Pat. No. 3,770,428. This application Apr. 6, 1973, Ser. No. 348,779

Int. Cl. C08g *9/24*

U.S. Cl. 260—67.5 **1 Claim**

1. A solid, resinous reaction product of N-beta-chloroethylcarbazole and formaldehyde comprising the recurring unit:



3,882,088
POLYESTERS BEARING POLYETHYLENIMINE TERMINAL GROUPS

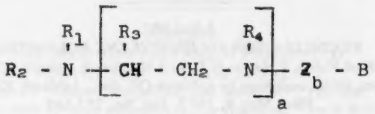
Darrell R. Thompson, Somerville, N.J., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 776,822, Nov. 18, 1968, abandoned, and Ser. No. 120,770, March 3, 1971, abandoned. This application Apr. 5, 1972, Ser. No. 241,401

Int. Cl. C08g *17/14*

U.S. Cl. 260—75 N **3 Claims**

1. A polymeric material of the formula



where

R_1, R_2 and R_4 are hydrogen, alkyl radicals of 1 through 4 carbon atoms, $-CH_2CH_2NH_2$, or $-CH_2CH_2OH$;

R_3 is hydrogen or an alkyl radical of 1 through 4 carbon atoms;

$Z_{[b]}$ is a dicarbamoyl radical;

B is a lactone, dicarboxylic acid/diol or hydroxycarboxylic acid polyester or copolyester segment;

a is a number 1 through 2000; and

b is 1.

3,882,089
VULCANIZING NATURAL OR SYNTHETIC RUBBER WITH A DIURETHANE DECOMPOSABLE TO DIISOCYANATE

Crispin Stuart Leworth Baker, Stapleford; Douglas Barnard, Welwyn, and Maurice Read Porter, Aston, all of England, assignors to The Malaysian Rubber Producers Research Association

Continuation-in-part of Ser. No. 172,589, Aug. 17, 1971. This application Apr. 5, 1974, Ser. No. 458,450

Claims priority, application United Kingdom, Aug. 18, 1970, 39804/70

Int. Cl. C08g *53/00, 22/16, 22/32*

U.S. Cl. 260—77.5 CR **8 Claims**

1. A method of vulcanizing a natural or synthetic rubber having an unsaturated carbon chain which method comprises heating at from 100°C to 200°C for from 6 hours to 10 seconds a mixture of the rubber with from 1 to 20 pphr of a compound having the general formula (I)

$$R(.NH.CO.O.N{=}Q{=}O)_m\ (.NCO)_n\ (.NH.CO.Y)_p \quad (I)$$

where

$m \geq 1$

$n \geq 0$

$p \geq 0$

$(n+p) \geq 1$

Q is an aromatic group in the quinonoid form,

R is an aromatic or saturated aliphatic group having a functionally of $(m+n+p)$, and

Y is an organic group joined to (.NH.CO.) through oxygen or nitrogen.

3,882,090
WATER-SOLUBLE POLYAMIDES FROM ALKYLENEOXY BIS(PROPYL-AMINE)

David R. Fagerburg; Burns Davis, and Charles J. Kibler, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 367,039, June 4, 1973, abandoned. This application Mar. 20, 1974, Ser. No. 452,889
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R **8 Claims**

1. A polyamide consisting essentially of the polymeric condensation product of components (A), (B) and (C) as follows:
A. a dicarboxylic acid selected from the group consisting of adipic acid, pimelic acid, suberic acid and combinations thereof,
B. a modifying amount of (1) up to 25 mole percent of a nine carbon atom aliphatic dicarboxylic acid, or (2) up to 15 mole percent of 1,12-dodecanedioic acid, said mole percents being based upon the total amount of dicarboxylic acid; and
C. an aliphatic diamine at least 95 mole percent of which is an (alkyleneoxy)bis(propylene) having the formula: $H_2N—C_3H_6—OR—_n—O—C_3H_6—NH_2$ wherein R is ethylene, 1,2-propylene or 1,3-propylene and *n* is an integer of 2 to about 13, or combinations thereof,
said polyamide having an inherent viscosity of from 0.15 to about 1.0 as measured at 25°C. at a concentration of 0.5 grams of said polyamide per 100 ml. of a solvent consisting of 60 percent by weight phenol and 40 percent by weight tetrachloroethane, said polyamide having a ratio of alkyleneoxy to amide linkages in the range of from at least about 3:2 to about 14:2.

3,882,091
EPOXY TERMINATED POLYSULFIDE POLYMERS AS ADHESIVE ADDITIVES FOR LIQUID POLYSULFIDE POLYMER-BASED ADHESIVE COMPOSITIONS

Jose L. Villa, Heightstown, N.J., assignor to Thiokol Corporation, Bristol, Pa.

Division of Ser. No. 252,646, May 12, 1972, Pat. No. 3,813,368. This application July 6, 1973, Ser. No. 377,159
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 **3 Claims**

1. An epoxy terminated polysulfide polymer prepared by reacting a liquid polythiol polymer having a molecular weight of 500 to 4,000 and vinyl cyclohexane diepoxide in an organic solvent at a temperature of from 50°C to 113°C. with a catalyst consisting of para-toluene sulfonic acid in a closed vessel equipped with refluxing apparatus and a stirrer.

3,882,092
ARYLENE SULFIDE POLYMERS

Charles W. Moberly, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,822
Int. Cl. C08g *23/00*
U.S. Cl. 260—79.1 **20 Claims**

1. A method of producing a polymer which comprises:
a. contacting at least one polyhalo-substituted aromatic compound wherein the halogen atoms are attached to aromatic ring carbon atoms, at least one base selected from the hydroxides of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium and barium and the carbonates of sodium, potassium, rubidium and cesium, at least one organic amide and at least one thiocarbamate having the formula

$$R_2N-\overset{\overset{X}{\|}}{C}-XR'$$

wherein each R is selected from hydrogen and R'', R' is selected from alkali metals and R'', and R'' is a monovalent hydrocarbyl radical selected from alkyl, cycloalkyl and aryl, and combinations of said radicals, the number of carbon atoms in said hydrocarbyl radical being within the range of 1 to about 12, and each X is selected from oxygen and sulfur, at least one X being sulfur, to form a composition; and,
b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,882,093
SULFONYL-CONTAINING FLUOROCARBON VINYL ETHERS AND ION EXCHANGE MEMBRANE FORMED THEREFROM

Robert John Cavanaugh, and William H. Calkins, both of Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Jan. 2, 1974, Ser. No. 430,050
Int. Cl. C07c *143/68, 143/70;* **C08f** *15/02*
U.S. Cl. 260—79.3 MU **2 Claims**

2. The process of claim 1 wherein the sulfuryl fluoride and said divinyl ether are initially present in the reaction in essentially equimolar amounts.

3,882,094
HYDROGENATION OF RUBBERS

Adel Farham Halasa, Bath, and Richard Gutierrez, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 21, 1973, Ser. No. 410,870
Int. Cl. C08d *5/02*
U.S. Cl. 260—85.1 **4 Claims**

1. The process of hydrogenating a rubber containing olefinic unsaturation which comprises treating the rubber in solution in an inert solvent containing as a hydrogenation catalyst $Co(Pyridine)_2(AlR_3$ or $H.AlR_2)_3$ in which each R is an alkyl group containing 1 to 8 carbon atoms, at a temperature of −20° C. to 500° C. and a pressure of 1 atmosphere to 15,000 psig.

3,882,095
PROCESS FOR FORMING POLYOLEFIN FIBERS

Robert W. Fowells; Robert A. Damon, and James G. Coma, all of Vancouver, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 69,194, Sept. 3, 1970, abandoned. This application Mar. 16, 1972, Ser. No. 235,416
Int. Cl. C08f *47/00, 1/88, 1/92*
U.S. Cl. 260—88.2 R **17 Claims**

1. A process for preparing polyolefin fibers comprising forming a solution of a polyolefin in a solvent at a temperature above the melt dissolution temperature of the polyolefin, subjecting the polyolefin solution to a shear stress of greater than about zero pounds (force)/ft² up to about 6.25 pounds (force)/ft² while cooling the polyolefin solution to a temperature below the melt dissolution temperature of the polyolefine, the magnitude of said shear stress being sufficiently great to precipitate the polyolefin as a fibrous gel having interconnecting capillary spaces filled with solvent intertwined within a fibrillar structure of fibrous polyolefin, and subsequently subjecting the fibrous gel formed during cooling to a shear stress of greater than about 0.1 pound (force/ft² thereby producing discrete, directly recoverable, polyolefin fibers without requiring further processing steps.

3,882,096

CATALYST FOR AND METHOD OF PREPARING ULTRA HIGH MOLECULAR WEIGHT POLYOLEFINS

Mitsuzo Shida, Barrington; Thomas J. Pullukat, Hoffman Estates, and Raymond E. Hoff, Palatine, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Sept. 4, 1973, Ser. No. 394,330

Int. Cl. C08f *1/66, 3/06*

U.S. Cl. 260—94.9 D **13 Claims**

1. A catalyst active for polymerizing ethylene to an ultra high molecular weight polymer, prepared by forming a hydrogel mixture of a porous support of the class consisting of silica, alumina, zirconia, thoria and mixtures thereof, about 1–200 weight percent of water, and chromium oxide in an amount to give about 0.1–50 weight percent of chromium on said support of which at least about 0.1 weight percent is hexavalent chromium, adding to said mixture an alkyl ester of titanium in an amount to give about 1–130 weight percent of titanium, said ester containing 1–7 carbon atoms in the alkyl group, and activating the resulting mixture with a dry gas that contains oxygen.

3,882,097

α-METHYL GLUTATHIONE, ANALOGS THEREOF, INTERMEDIATES THEREFORE AND PROCESSES FOR THEIR PREPARATION

Karl Pfister, III, Westfield, N.J.; Daniel F. Veber, Ambler, and Ralph F. Hirschmann, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 856,878, Aug. 13, 1969, abandoned, which is a continuation of Ser. No. 605,958, Dec. 30, 1966, abandoned. This application May 10, 1972, Ser. No. 252,139

Int. Cl. C07c *103/52;* **A61k** *17/02;* **C07a** *7/00*

U.S. Cl. 260—112.5 **1 Claim**

1. A process for the preparation of γ-(α-methyl-glutamyl)-L-cysteinyl-glycine and the aspartyl analog thereof which comprises reacting under aqueous alkaline conditions, at a pH of about 7.5 to 9.5, at a temperature of about 20° to 30°C., and for a period of about 10 min. to about 2 hours, S-benzyl-L-cysteinyl-glycine with an N-carbobenzoxy-α-methyl glutamic acid anhydride or an aspartic acid anhydride analog thereof, the reactants being in the proportion of equimolar quantities of each up to about 25 percent molar excess of either reactant, adjusting the pH to about 1.5 to 3.5 thereby decarboxylating the resulting carbamate, and reacting the resulting γ-(N-carbobenzoxy-α-methyl-glutamyl)-S-benzyl-L-cysteinyl-glycine or aspartyl analog thereof with sodium in liquid ammonia thereby removing the S-benzyl and N-carbobenzoxy protecting groups.

3,882,098

SYNTHESIS OF DES-ALA^1, GLY^2, ASN^5-SRIF AND INTERMEDIATES

Dimitrios Sarantakis, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,441

Int. Cl. C07c *103/52;* **C07g** *7/00*

U.S. Cl. 260—112.5 **6 Claims**

3. An undecapeptide of the formula:

R-Cys(R^1)-Lys(R^2)-Phe-Phe-Trp-Lys(R^2)-Thr(R^3)-Phe-Thr(R^3)-Ser(R^4)-Cys(R^1)-OR^5

wherein:

R is selected from the group consisting of hydrogen or an α-amino protecting group;

R^1 is a protecting group for the sulfhydryl group on the cysteinyl amino acid residue selected from the group consisting of benzyl, trityl, benzyloxycarbonyl, benzhydryl, tetrahydropyranyl, acetamidomethyl, benzoyl, benzylthiomethyl, ethylcarbonyl, thioethyl, p-methoxybenzyloxycarbonyl, sulfate salt and substituted benzyl wherein said substituent is selected from the group consisting of methyl, methoxy and nitro;

R^2 is selected from the group consisting of hydrogen and a protecting group for the side chain amino substituent of the lysine residue selected from the group consisting of benzyl, chlorobenzyloxycarbonyl, tosyl, 2,4-dinitrophenyl, t-amyloxycarbonyl, t-butyloxycarbonyl and benzyloxycarbonyl;

R^3 and R^4 are protecting groups for the alcoholic hydroxyl group of the threonine and serine residues selected from the group consisting of acetyl, tosyl, benzoyl, tert-butyl, trityl, benzyl and benzyloxycarbonyl; and

R^5 is a α-carboxyl protecting group selected from the class consisting of C_1–C_8 alkyl, benzyl, substituted benzyl, phenacyl, phthalimidomethyl, 3-methylthioethyl, 4-picolyl and 4-(methylthio) phenyl, said substituent on benzyl being selected from at least one of methyl, methoxy and nitro; and the acid addition salts thereof, said amino acid residues in said undecapeptide having an asymmetric α-carbon atom being of the L-configuration.

3,882,099

PHENYL-AZO-(POLYCYCLIC)HETEROCYCLIC METAL COMPLEXES

Francois L'Eplattenier, Therwil, and Andre Pugin, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

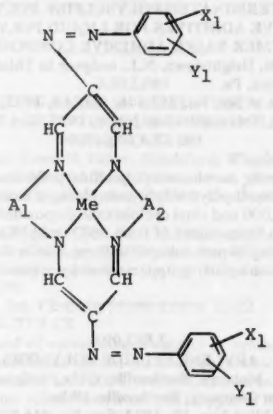
Filed Dec. 12, 1972, Ser. No. 314,493

Claims priority, application Switzerland, Dec. 15, 1971, 18357/71

Int. Cl. C09b *45/48*

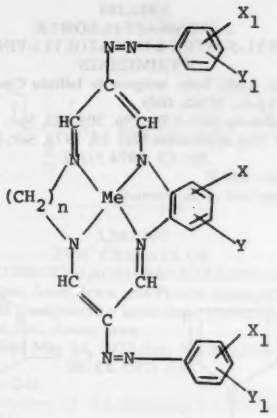
U.S. Cl. 260—146 R **8 Claims**

1. A polycyclic metal complex of the formula



wherein A_1 is alkylene of two to three carbon atoms, 1,2-lower-cycloalkylene, 1,2-phenylene, or 1,8-naphthalene; A_2 is a lower alkylene of two to three carbon atoms, 1,2-lower-cycloalkylene, or 1,8-naphthalene; Me is Zn, Cu, Co or Ni; X_1 and Y_1 is hydrogen, chloro, lower alkyl, lower alkoxy, phenoxy, phenylazo, lower alkanoyl, lower alkanoylamino, carbonamido, lower alkoxycarbonyl, trifluoromethyl, nitro, cyano, lower alkylsulphonyl, carboxylic acid group or sulphonic acid group.

2. A polycyclic metal complex of the formula



wherein X_1, and Y_1 is hydrogen, chloro, lower alkyl, lower alkoxy, phenoxy, phenylazo, lower alkanoyl, lower alkanoylamino, carbonamido, lower alkoxycarbonyl, trifluoromethyl, nitro, cyano, lower alkylsulphonyl, carboxylic acid or sulphonic acid; *n* is 2 or 3; X and Y is hydrogen, chloro, lower alkyl, alkoxycarbonyl, alkylsulphonyl, phenyl, phenoxy, carbonamido, or lower alkanoylamino; and Me is Cu, Zn, Ni or Co.

3,882,100

DERIVATIVES OF 6-AMINO PENICILLANIC ACID

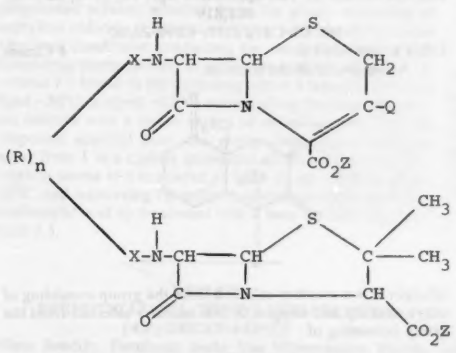
Donald J. Perrella, Princeton Junction, and Joseph E. Dolfini, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 22, 1972, Ser. No. 291,443

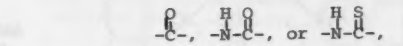
Int. Cl. C07d *99/16;* **C07g** *99/24*

U.S. Cl. 260—239.1 **11 Claims**

1. A compound of the formula



wherein R is an aliphatic hydrocarbon group of from two to 10 carbon atoms, a monocyclic alicyclic group of five or six carbon atoms in the ring; a bicyclic alicyclic group of eight to 10 carbon atoms; benzyl, chlorophenyl, phenyl or tolyl, the phenyl or tolyl groups optionally may be joined to a second phenyl or tolyl group directly or through a methylene group; or a five- or six-membered monoheterocyclic group wherein the heteroatom is N, O or S, or a five- or six-membered diheterocyclic group wherein each heteroatom is N; X is



n is 0 or 1, but may be zero only when X is

Q is $-CH_3$ or $-CH_2OCOCH_3$, and Z is hydrogen, a physiologically acceptable metal, NH_4, a physiologically acceptable organic amine selected from triethylamine, procaine, dibenzylamine, N-benzyl-β-phenethylamine, N,N'-dibenzylethylenediamine or N-ethylpiperidine or an alkyl group of from one to seven carbon atoms.

3,882,101

2-HALO-5-ARYL-3H-1,4-BENZODIAZEPINES

John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,701

Int. Cl. C07d *53/06*

U.S. Cl. 260—239 BD **1 Claim**

1. A compound which is 2,7-dichloro-5-(o-chlorophenyl)-3H-1,4-benzodiazepine.

3,882,102

PROCESS FOR THE PURIFICATION OF CAPROLACTAM

Otto Immel, and Hans-Helmut Schwarz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 197,514, Nov. 10, 1971. This application Oct. 24, 1973, Ser. No. 409,046

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 A **4 Claims**

1. A process for the treatment of the crude product resulting from the catalytic rearrangement of cyclohexanone oxime, in the gas phase, to ε-caprolactam in the presence of a boron trioxide-containing catalyst which comprises the steps of:

a. dissolving said crude produce in benzene or an alkyl benzene having seven to eight carbon atoms;

b. stirring and cooling said solution and precipitating ε-caprolactam at about 0° to 50°C;

c. filtering the resultant crystal sludge from said solution; and

d. recovering substantially pure ε-caprolactam by vacuum distillation.

3,882,103

N-PHOSPHORYL AND N-PHOSPHONYL AMIDINES

Ernst Beriger, Allschwil; Odd Kristiansen, Reinach/bl; Kurt Rüfenacht, Basel, all of Switzerland, and Jörg Bader, Deceased, late of Ariesheim, Switzerland (by Dagmar Bader-Ludwig, legal representative), assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

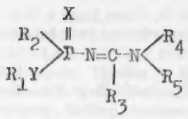
Filed Mar. 13, 1973, Ser. No. 340,805

Claims priority, application Switzerland, Mar. 17, 1972, 4054/72

Int. Cl. C07f *9/24*

U.S. Cl. 260—240 G **22 Claims**

1. A compound of the formula



wherein

R_1 represents phenyl, or phenyl mono- to trisubstituted by halogen, mono- or disubstituted by C_1-C_4-alkyl, C_1-C_4-alkylthio, nitro, cyano or trifluoromethyl, or monosubstituted by C_1-C_4-carbalkoxy,

R_2 represents methyl, methoxy, ethyl, ethoxy or phenyl,

R_3 represents hydrogen or methyl,

R_4 and R_5 represent methyl, ethyl, n-propyl, isopropyl or allyl,

X and Y represent oxygen or sulphur, or

R_4 and R_5 with the nitrogen atom to which they are bound form the morpholino, piperidino or pyrrolidino ring, or

R_3 with R_4 or R_5 forms a pyrrolidino or piperidino ring, whereby then the group R_4 or R_5 not participating in the ring formation represents methyl or ethyl.

3,882,104

2-AZACYCLOALKYLMETHYL SUBSTITUTED PHENYL CARBINOLS AND KETONES

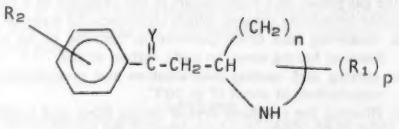
J. Martin Grisar, and George P. Claxton, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 25, 1973, Ser. No. 354,189

Int. Cl. C07d *29/16, 29/20*

U.S. Cl. 260—240 CA **5 Claims**

1. A 2-azacycloalkylmethyl substituted phenyl carbinol and ketone having the formula:



wherein *n* is an integer of from 3 to 5; *p* is an integer of from 1 to 2; R_1 is hydrogen or lower alkyl having from one to four carbon atoms; Y is the radical =O or

R_2 is selected from the group consisting of phenyl, halophenyl, trifluoromethylphenyl, alkylphenyl having from seven to 10 carbon atoms, alkoxyphenyl having from seven to 10 carbon atoms, alkylthiophenyl having from seven to 10 carbon atoms, phenoxy, alkylphenoxy having from seven to 10 carbon atoms, halophenoxy, trifluoromethylphenoxy, alkoxyphenoxy having from seven to 10 carbon atoms, alkylthiophenoxy having from seven to 10 carbon atoms, phenylthio, phenylalkyl having from seven to 10 carbon atoms, phenylvinyl, phenylalkoxy having from eight to 10 carbon atoms, phenoxyalkoxy having from eight to 10 carbon atoms; and the pharmaceutically acceptable acid addition salts thereof.

3,882,105

2-AMINO-4-[2-(1-LOWER ALKYL-5-NITRO-2-IMIDAZOLYL)-VINYL]-PYRIMIDINES

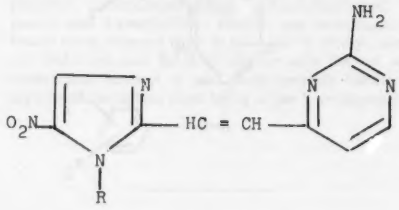
Aldo Garzia, Lodi, Italy, assignor to Istituto Chemioterapico Italiano S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 309,483, Nov. 24, 1972, abandoned. This application May 25, 1973, Ser. No. 364,025

Int. Cl. C07d *51/42*

U.S. Cl. 260—240 E **3 Claims**

1. A compound of the formula



wherein R is lower alkyl of one to about six carbon atoms.

3,882,106

DISUBSTITUTED NAPHTHALENONE COMPOUNDS

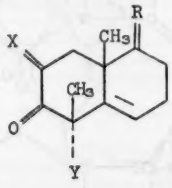
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 278,508, Aug. 7, 1972, which is a division of Ser. No. 471,143, June 17, 1970, Pat. No. 3,714,195, which is a continuation-in-part of Ser. No. 708,498, Feb. 27, 1968, Pat. No. 3,565,958. This application Apr. 18, 1974, Ser. No. 461,819

Int. Cl. C07d *5/34;* **C09b** *23/00*

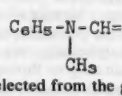
U.S. Cl. 260—240 R **4 Claims**

1. A compound of the formula:

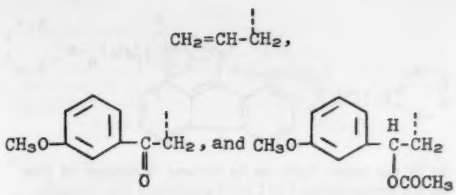


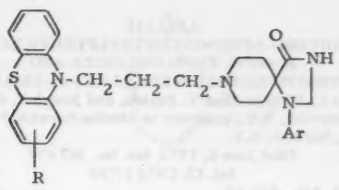
wherein R is a member selected from the group consisting of ethylenedioxy and oxygen; X is a member selected from the group consisting of

and



and Y is a member selected from the group consisting of





3,882,107
ZINC CHELATE OF 2,4-DIHYDROXY-1,4(2H)-BENZOXAZINE-3-ONE

Carl Lee Tipton, Ames, Iowa, and Francis Hsiang-Chian Tsao, Chicago, Ill., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 14, 1973, Ser. No. 360,336
Int. Cl. C07f 3/06
U.S. Cl. 260—242 **1 Claim**

1. The complex of 2,4-dihydroxy-1,4-(2H)-benzoxazin-3-one (DIBOA) with zinc containing 1 mole zinc to 2 moles of DIBOA.

3,882,108
PREPARATION OF 7-AMINO CEPHALOSPORIN COMPOUND

Philip Howard Chapman, Dendron near Ulverston, and James Raymond Hilligan, Grange-over-Sands, both of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed Apr. 4, 1972, Ser. No. 241,087
Claims priority, application United Kingdom, Apr. 7, 1971, 8988/71
Int. Cl. C07d 99/24
U.S. Cl. 260—243 C **1 Claim**

1. In a process for the preparation of 7β-amino-3-acetoxymethylceph-3-em-4-carboxylic acid, the steps which include reacting 3-acetoxymethyl-7β-(D-5-amino-5-carboxypentanamido)ceph-3-em-4-carboxylic acid wherein the amino group is blocked with from about 0.20 to about 2 moles of a phosphorus trihalide selected from the group consisting of phosphorus trichloride and phosphorus tribromide at a temperature from about −50°C to about +65°C in an organic halogenated solvent selected from the group consisting of methylene chloride, 1,2-dichloroethane and chloroform under anhydrous conditions; contacting the resultant solution with phosphorus pentachloride in molar proportions of about 1:1 to about 1:3 based on the cephalosporin at a temperature from about −50°C to about +25°C; commingling the resultant reaction mixture with a molar excess of an imino ether forming compound selected from the group consisting of alkanols having from 1 to 6 carbon atoms and alkane diols having 2 to 4 carbon atoms at a temperature from about −50°C to about +10°C; and recovering 7β-amino-3-acetoxymethylceph-3-em-4-carboxylic acid by treatment with a base to raise the pH to about 3.5.

3,882,109
[(PHENOTHIAZINYL)PROPYL]-TRIAZASPIRO [4,5]-DECAN-4-ONES

Willem Soudijn, Turnhout; Ineke Van Wijngaarden, Beerse, and Paul Adriaan Jan Janssen, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 335,848, Feb. 26, 1973, abandoned. This application Dec. 28, 1973, Ser. No. 429,432
Int. Cl. C07d 93/14
U.S. Cl. 260—243 A **6 Claims**

1. A chemical compound selected from the group consisting of a [phenothiazinyl)propyl]-1,3,8-triazaspiro[4,5]-decan-4-one having the formula:

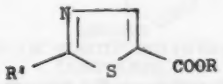
and the therapeutically active acid addition salts thereof, wherein R is a member selected from the group consisting of hydrogen, halo and trifluoromethyl and Ar is a member selected from the group consisting of phenyl and halophenyl.

3,882,110
NOVEL 2-ALKYL-5-THIAZOLE-CARBOXYLIC ACID DERIVATIVES

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel Uclaf, Paris, France

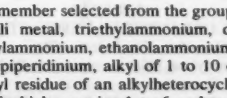
Continuation of Ser. No. 244,909, April 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 842,017, July 15, 1969, abandoned. This application Jan. 9, 1974, Ser. No. 431,881
Int. Cl. C07d 91/32
U.S. Cl. 260—247.1 M **17 Claims**

1. 2-Alkyl-5-thiazole carboxylic acid derivative of the formula



wherein R is a member selected from the group consisting of hydrogen, an alkali metal, triethylammonium, diisopropylammonium, diethylammonium, ethanolammonium, collidinium, morpholinium, piperidinium, and alkyl having 1 to 10 carbon atoms and R′ is a linear alkyl of 3 to 12 carbon atoms.

12. 2-Alkyl-5-thiazole carboxylic acid derivatives of the formula



wherein R is a member selected from the group consisting of hydrogen, alkali metal, triethylammonium, diisopropylammonium, diethylammonium, ethanolammonium, collidinium, morpholinium, piperidinium, alkyl of 1 to 10 carbon atoms, benzyl, the alkyl residue of an alkylheterocyclic alcohol the alkyl residue of which contains 1 to 6 carbon atoms and of which the heterocyclic residue is selected from the group consistint of furyl, thienyl and pyridyl, α-glyceryl, β-glyceryl, diethylaminoethyl, diethylaminopropyl and dipropylaminoethyl and R′ is a linear alkyl of 3 to 12 carbon atoms.

3,882,111

1,2-DIHYDRO-3-PHENOXYMETHYLPYRIDO[3,4-E]-AS-RIAZINE HYDROCHLORIDE AND 3-PHENOXYMETHYLPYRIDO[3,4-E]-AS-TRIAZINE

George C. Wright; Allan V. Bayless, and Joseph E. Gray, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 6, 1973, Ser. No. 367,497

Int. Cl. C07d *57/34*

U.S. Cl. 260—248 AS **4 Claims**

1. A compound selected from the group consisting of 1,2-dihydro-3-phenoxymethylpyrido[3,4-e]-as-triazine hydrochloride and 3-phenoxymethylpyrido[3,4-e]-as-triazine.

3,882,112

7-PHENYL-3-[2-(DIALKYLAMINO)-ALKYL]-3,4-DIHYDROAS-TRIAZINO[4,3-A][1,4]BENZODIAZEPIN-2(1H)-ONES

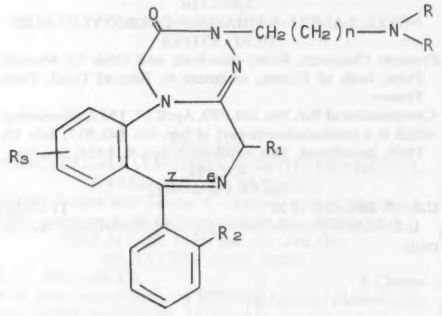
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 19, 1973, Ser. No. 398,641

Int. Cl. C07d *57/34*

U.S. Cl. 260—248 AS **9 Claims**

1. A compound of the formula



wherein *n* is 1 or 2; wherein R is hydrogen, alkyl of one to three carbon atoms, inclusive, or together

is pyrrolidino, piperidino, N-methylpiperazino, or morpholino; wherein R_1 is hydrogen or alkyl as defined above; and wherein R_2 and R_3 are hydrogen, alkyl as defined above, fluorine, chlorine, bromine, nitro, trifluoromethyl, or alkylthio in which alkyl is defined as above, and the pharmacologically acceptable acid addition salts thereof.

3,882,113

FLUORANTHENE DERIVATIVES

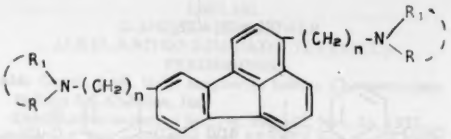
William L. Albrecht, Cincinnati, Ohio, and Robert W. Fleming, Ann Arbor, Mich., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Dec. 21, 1972, Ser. No. 317,150

Int. Cl. C07d *87/28*

U.S. Cl. 260—246 B **6 Claims**

1. A 3,9-bis-basic alkane of fluoranthene having the general formula:



wherein *n* is an integer of from 2 to 6; R and R_1 are each selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the vinyl unsaturation is in a position other than in the 1-position of the alkenyl group, and when R and R_1 are taken together with the nitrogen atom to which they are attached represent the pyrrolidinyl, morpholino, piperidino or 4-lower alkyl piperidino radical, said 4-lower alkyl piperidino radical having from 1 to 4 carbon atoms; and their pharmaceutically acceptable acid addition salts.

3,882,114

N-(MORPHOLINOMETHYL CARBAMYL) CYSTEAMINE AND GLYCINE

Gregoire Kalopissis, Paris; Jean-Louis Abegg, Le Perreux; Guiliana Ghilardi, and Henri Philippe de Beaulieu, both of Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 770,074, Oct. 23, 1968, Pat. No. 3,678,157. This application Apr. 17, 1972, Ser. No. 244,906

Claims priority, application Luxembourg, Oct. 26, 1967, 54745

Int. Cl. C07d *87/42, 87/46*

U.S. Cl. 260—247.1 R **2 Claims**

1. N-(morpholinomethylcarbamyl) cysteamine.

3,882,115

PREPARATION OF 2-ARYL-AS-TRIAZINE-3,5 (2H,4H)-DIONES

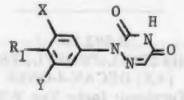
Banavara L. Mylari, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed June 25, 1973, Ser. No. 373,253

Int. Cl. C07d *55/10*

U.S. Cl. 260—248 AS **8 Claims**

1. A process for the preparation of a compound of the formula

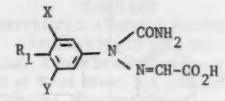


wherein X is selected from the group consisting of hydrogen and methyl;

Y is selected from the group consisting of hydrogen, methyl and chloro; and

R_1 is selected from the group consisting of hydrogen, 2-chlorophenoxy and 2-chloro-4-(N-methyl-N-ethylsulfamoyl)phenoxy,

which comprises contacting a compound of the formula



with an equimolar amount of an alkali metal salt of an alkanoic acid containing from 2 to 5 carbon atoms and an equimolar amount of an alkanoic acid anhydride containing from 4 to 8 carbon atoms at 75°–150° C. in a reaction-inert solvent.

3,882,116
PREPARATION OF PERCHLORINATED HETEROCYCLIC COMPOUNDS

Walter Mahler, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 9, 1972, Ser. No. 251,654
Int. Cl. C07d *55/42, 51/36, 51/76*
U.S. Cl. 260—248 C **13 Claims**

1. The process of obtaining a mixture of at least three of the perchlorinated compounds, cyanuric chloride, perchloropyrazine, perchloropyrimidine and perchloropyridine which comprises

heating, at a temperature, in the range of about 350° to 750°C.,

a reaction charge consisting initially of hexachlorobenzene and one or two of said compounds.

3,882,117
PROCESS FOR THE PREPARATION BENZENE ISOCYANAURATES

Richard Garth Pews; Lennon H. McKendry, both of Midland, Mich., and Ralph M. Rodia, Salem, Oreg., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 285,503, Aug. 31, 1972, Pat. No. 3,804,844, which is a continuation-in-part of Ser. No. 94,622, Dec. 2, 1970. This application Nov. 1, 1973, Ser. No. 411,938
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 NS **4 Claims**

1. A process for the preparation of a benzene isocyanurate compound which comprises reacting a benzene compound, ring-substituted with at least one displaceable substituent selected from the group consisting of chloro, bromo, fluoro, iodo, $-N_2^+$, $-OSO_2R$, $-SO_2R$, and $-SR_2^+$, wherein each R independently represents hydrogen, phenyl or a loweralkyl radical of from 1 to about 4 carbon atoms, inclusive, with an alkali metal cyanate in the presence of a high dielectric-aprotic solvent.

3,882,118
PROCESS FOR THE PREPARATION OF UNSYMMETRICALLY-SUBSTITUTED ALKANOLAMINO-S-TRIAZINES

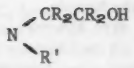
Thirumurti L. Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 29, 1972, Ser. No. 319,931
Int. Cl. C07d *55/22*
U.S. Cl. 260—249.6 **10 Claims**

1. A process for the preparation of unsymmetrically-substituted alkanolamino-s-triazines of the formula:

wherein

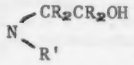
B is



R is hydrogen or lower alkyl,

R′ is CR_2CR_2OH or lower alkyl and

A is NR_2,



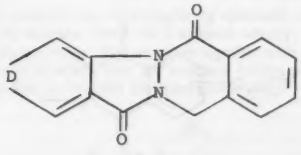
C_1–C_{12} alkoxy, phenoxy, aziridyl, pyrrolidyl or piperidyl with the proviso that both A's cannot be B, which comprises reacting cyanuric chloride with a reactive hydrogen-containing compound having the formula: A–H wherein A is as described above in the presence of an acid acceptor to obtain a mono- or dichloro-containing intermediate and further reacting said intermediate without isolation or purification with an alkanolamine in the presence of an acid acceptor the mole ratio of cyanuric chloride to reactive hydrogen-containing compound to alkanolamine being from 1:1:2 to 1:2:1, respectively.

3,882,119
TETRACYCLIC SUBSTITUTED PHTHALAZINE COMPOUNDS

Giangiacomo Nathansohn, Milan, and Elvio Bellasio, Albate, (Como), both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 96,625, Dec. 9, 1970, abandoned. This application Oct. 15, 1973, Ser. No. 406,730
Claims priority, application Italy, Jan. 27, 1970, 19810/70
Int. Cl. C07d *51/06, 57/02*
U.S. Cl. 260—250 P **9 Claims**

1. A compound of the formula



wherein D represents a divalent radical —CH=Y—, in which Y is nitrogen or CR, and in which R is selected from hydrogen, lower alkyl of from 1 to 4 atoms, nitro, amino, acylamino in which the acyl moiety is formyl, acetyl, propionyl, butyryl, phenacetyl or benzoyl, phenylamino, benzylamino, and lower alkylamino or di-lower alkylamino in which the lower alkyl moieties have from 1 4 carbon atoms.

3,882,120
SULFONYL COMPOUNDS

Steffen Piesch, Oberursel/Taunus, and Friedrich Engelhardt, Frankfurt, Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur AG

Filed June 2, 1972, Ser. No. 259,201

Claims priority, application Germany, June 5, 1971, 2128011

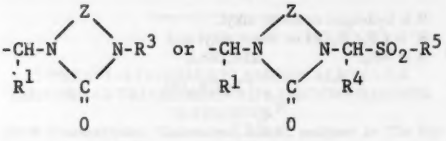
Int. Cl. C07d *51/18*

U.S. Cl. 260—251 R **5 Claims**

1. A compound of the formula

$$R - SO_2 - X$$

wherein X is



R and R^3 are phenyl or p-methylphenyl, 4-methoxyphenyl, p-chlorophenyl, 3-trifluoromethylphenyl, 4-nitrophenyl, 3-cyanophenyl, 4-acetaminophenyl, 3,4-dichlorophenyl, 2,5-dichlorophenyl, 2,6-dichlorophenyl, 2,3,4-trichlorophenyl, 2,5-dimethoxyphenyl, 3,4,5-trimethoxyphenyl, 2-methoxy-5-chlorophenyl, 2-chloro-5-nitrophenyl, 2-chloro-5-trifluoromethylphenyl, 2-chloro-6-methylphenyl, 2-chloro-5-methoxyphenyl;

R^1 and R^4 are phenyl, p-chlorophenyl, o-chlorophenyl, p-bromophenyl, p-methoxyphenyl, 3,4,5-trimethoxyphenyl, o-hydroxyphenyl, 2,5-dichlorophenyl, 3,4-dichlorophenyl, p-dimethylaminophenyl, p-acetaminophenyl, methylphenyl, m-nitrophenyl, p-nitrophenyl, hydrogen, carboxy or $COOX_1$ wherein X_1 is ammonium, sodium, potassium, calcium, copper, trimethylammonium, triethylammonium, triethanolammonium, morpholinium, piperidinium, pyrrolidinium or anilinium;

R^3 is hydrogen and

Z is alkylene having 2 to 3 carbon atoms or hydroxy substituted ethylene.

3,882,121
DICARBOXYLIC COMPOUNDS HAVING 2,4-QUINAZOLINEDIONE RINGS

Choua Cohen, Grenoble; Bruno Durif-Varambon, Eybens; Robert Salle, and Bernard Sillion, both of Grenoble, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Sept. 13, 1972, Ser. No. 288,478

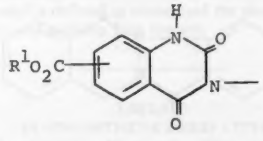
Claims priority, application France, Sept. 15, 1971, 71.33327; Apr. 10, 1972, 72.12565

Int. Cl. C07d *51/48*

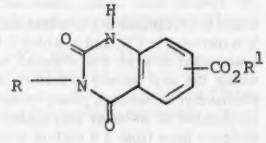
U.S. Cl. 260—256.4 Q **11 Claims**

1. A compound of the formula:

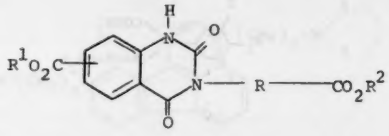
(I)



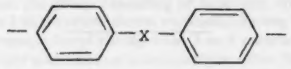
or



(II)



in which R is alkylene of 1–20 carbon atoms, phenylene, tolylene, ethylphenylene, chlorophenylene, biphenylene, naphthylene, or a divalent radical of the formula:



wherein X is — O —, — S —, — SO —, — SO_2 —, or — CH_2 —,

R^1 is hydrogen or an alkyl or cycloalkyl of 1–10 carbon atoms and

R^2 is alkyl or cycloalkyl of 1–10 carbon atoms.

3,882,122
THIENOPYRAZINE DIOXIDES AND METHODS OF MAKING SAME

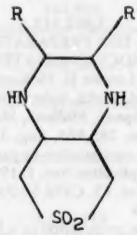
Edward L. Hagen, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 28, 1973, Ser. No. 336,752

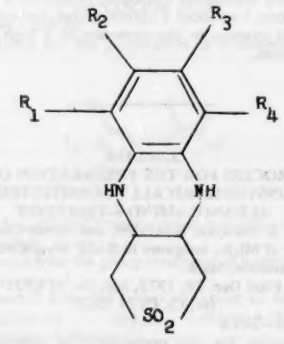
Int. Cl. C07d *51/66*

U.S. Cl. 260—268 TR **10 Claims**

1. A compound selected from the group consisting of compounds having the formula:



wherein R is hydrogen and R′ is hydrogen or methyl, and a compound having the formula:



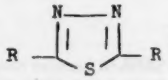
wherein R_1, R_2, R_3 and R_4 are hydrogen.

3,882,123
2,5-BIS-SUBSTITUTED AMINO-1,3,4-THIADIAZOLES AND METHOD OF USE

Harry Lee Lindsay; Robert Bruce Angier, and Keith Chadwick Murdock, all of Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1973, Ser. No. 384,641
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 H **5 Claims**

1. A compound selected from the group consisting of those of the formula:



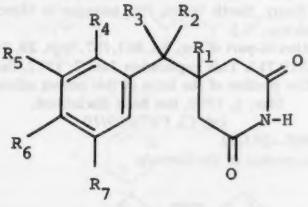
wherein R is selected from the group consisting of cyclohexylamino, cyclopentylamino and N-(lower alkyl of 1–2 carbon atoms)piperazin-1-yl, and pharmaceutically acceptable acid addition salts thereof.

3,882,124
3-(5-OXYPHENETHYL)-GLUTARIMIDES

Richard Kirchlechner; Werner Rogalski, and Jürgen Seubert, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Aug. 18, 1972, Ser. No. 281,652
Claims priority, application Germany, Aug. 21, 1971, 2141946
Int. Cl. C07d *29/20*
U.S. Cl. 260—281 **13 Claims**

1. A glutaric acid imide of the formula



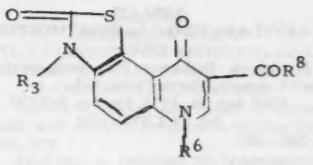
wherein R_1, R_2 and R_3 are H or unbranched alkyl or unbranched alkoxy, each of up to 6 carbon atoms; R_4 and R_6 are H, halogen, OH, alkoxy of up to 6 carbon atoms, benzyloxy or tetrahydropyranyloxy, NO_2, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec.butyl, amino, alkylamino, or dialkylamino, each of up to 8 carbon atoms, or alkanoyl of up to 7 carbon atoms; R_5 is H, halogen, OH, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec.butyl, amino, alkylamino or dialkylamino, each of up to 8 carbon atoms, or alkanoyl of up to 7 carbon atoms; or R_4 and R_5 or R_5 and R_6 collectively are —CH=CH—CH=CH—; and R_7 is OH, alkoxy of up to 6 carbon atoms, benzyloxy or tetrahydropyranyloxy.

3,882,125
2,9-DIOXO-3,6 SUBSTITUTED THIAZOLO[5,4-F] QUINOLINE-8-CARBOXYLATES

Renzo Dohmori, Yachiyo; Shizuo Kadoya, Tokyo; Senkichi Nagasaki, Funabashi, and Hidemasa Ogawa, Tokyo, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1972, Ser. No. 300,950
Claims priority, application Japan, Oct. 26, 1971, 46-84846
Int. Cl. C07d *91/42*
U.S. Cl. 260—283 S **21 Claims**

1. A compound having the formula:



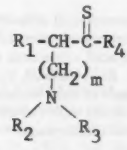
wherein R^3 is C_1—C_6 lower alkyl or C_1—C_6 alkenyl; R^6 is C_1—C_6 lower alkyl; and R^8 is an —OR, or —NHR'' group, in which R is a member selected from the group consisting of an C_1—C_6 lower alkylamino C_1—C_6 lower alkyl, a piperidino C_1—C_6 lower alkyl, an C_1—C_6 lower alkyl piperidino C_1—C_6 lower alkyl, an alkanoyloxy C_1—C_6 lower alkyl, a hydroxy C_1—C_6 lower alkyl, a halogeno C_1—C_6 lower alkyl, C_1—C_6 lower alkyl, an oxooxazolidino C_1—C_6 lower alkyl, C_1—C_6 lower alkenyl; and R'' is an C_1—C_6 lower alkyl amino C_1—C_6 lower alkyl, or the pharmaceutically acceptable acid-addition salt thereof.

3,882,126
2-AMINO(AND 2-AMINOMETHYL)-2-QUINOLYLTHIOACETAMIDES

L. Martin Brenner, Upper Darby, and Bernard Loev, Broomall, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 236,593, March 21, 1972, Pat. No. 3,740,409. This application Mar. 30, 1973, Ser. No. 346,488
Int. Cl. C07d *33/48*
U.S. Cl. 260—283 S **4 Claims**

1. A compound of the formula:

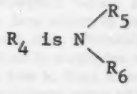


in which:

m is 0 or 1;

R_1 is a 2-quinolyl ring, said ring being optionally nonsubstituted by halogen, lower alkyl or lower alkoxy;

R_2 and R_3 are lower alkyl or taken together with the nitrogen atom to which they are attached form a piperidino, pyrrolidino or N-lower alkylpiperazino ring;



or NH-$(CH_2)_n$-cycloalkyl, said cycloalkyl having 3-6 carbon atoms;

R_5 and R_6 are hydrogen or lower alkyl and *n* is 0 or 1 or a pharmaceutically acceptable acid addition salt thereof.

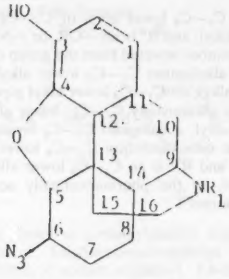
3,882,127

17-ALKENYL-6β-AZIDO-4,5α-EPOXYMORPHINAN-3-OLS

Robert I. Meltzer, Rockaway, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 31, 1973, Ser. No. 393,379
Int. Cl. C07d *43/28*
U.S. Cl. 260—285 **2 Claims**

1. A compound of the formula:



wherein R_1 is alkenyl having 3 to 8 carbon atoms and the pharmaceutically acceptable acid addition salts.

3,882,128

ISOCYANATED IMIDES OF HYDROCARBON ANHYDRIDES AND BLENDS THEREOF

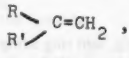
Robin A. McLaren, Ballwin, and Charles A. Alcott, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 788,947, Jan. 3, 1969, abandoned. This application May 18, 1973, Ser. No. 361,765
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 A **10 Claims**

1. An isocyanated imide reaction product of

1. an organic isocyanate or a mixture of organic isocyanates and
2. an imide of a member selected from the group consisting of

an olefin-maleic compound adduct prepared by reacting (a) a maleic compound selected from the group consisting of maleic acid, citraconic acid, ethylmaleic acid, glutaconic acid, itaconic acid, methylitaconic acid, the anhydride of each of said acids and an ester drivative of each of said acids with (b) an olefin of the formula $R\text{-}CH{=}CH_2$ or of the formula



where R is a hydrocarbon radical of 9-100 carbon atoms and R′ is hydrogen or $H(CH_2)_n$, n being 1-100 , and

ii. a wax-maleic compound graft copolymer prepared by reacting (a) a maleic compound selected from the group consisting of maleic acid, citraconic acid, ethylmaleic acid, glutaconic acid, itaconic acid, methylitaconic acid, the anhydride of each of said acids and an ester derivative of each of said acids with (b) a wax selected from the group consisting of plastic microcrystalline waxes, tank bottom waxes, tank bottom microcrystalline waxes, solvent extracted microcrystalline waxes, Fischer-Tropsch waxes, polyalkylene hydrocarbon waxes and blends thereof.

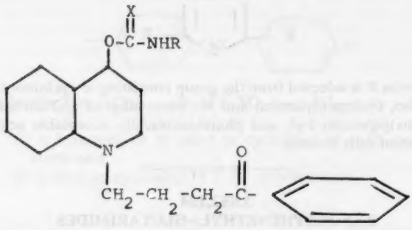
3,882,129

4-CARBAMOYL-1-(P-FLUOROBENZOYLPROPYL)DECAHYDROQUINALINE DERIVATIVES

Maurice Prost, Brussels, and Marcel Urbain, Waterloo, both of Belgium, assignors to Labaz, Paris, France

Filed Nov. 24, 1972, Ser. No. 309,446
Claims priority, application United Kingdom, Nov. 23, 1971, 54466/71
Int. Cl. C07d *33/48*
U.S. Cl. 260—287 R **10 Claims**

1. A heterocyclic compound of the formula



and pharmaceutically acceptable acid addition salts thereof, wherein R represents hydrogen, lower alkyl having 1 to 3 carbon atoms, allyl, cycloalkyl having 5 to 6 carbon atoms, phenyl, phenyl substituted by a fluorine, chlorine or bromine atom or methoxyl group, or benzyl, and X represents an oxygen or sulphur atom.

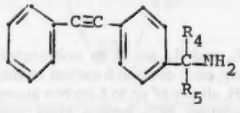
3,882,130

4-PHENYLETHYNYL BENZYLAMINES

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 861,987, Sept. 29, 1969, Pat. No. 3,719,712. This application Jan. 7, 1972, Ser. No. 216,264The portion of the term of this patent subsequent to Mar. 6, 1990, has been disclaimed.
Int. Cl. C07d *29/10*
U.S. Cl. 260—293.72 **5 Claims**

1. A compound of the formula



and N-loweralkyl and N,N-diloweralkyl derivatives thereof in which the alkyls contain from 1 to 4 carbons, wherein R_4 and R_5 are hydrogen or loweralkyl substituents.

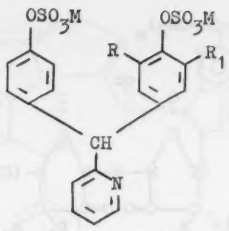
3,882,131

PROCESS FOR PREPARING 4,4-DISULPHOXY-DIPHENYL-(2-PRYIDYL)-METHANE DERIVATIVES

Tiberio Bruzzese, Milan, Italy, assignor to SPA - Societa Prodotti Antibiotics S.p.A., Milan, Italy

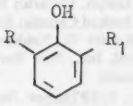
Division of Ser. No. 288,076, Sept. 11, 1972, Pat. No. 3,822,273. This application Oct. 5, 1973, Ser. No. 403,978
Claims priority, application United Kingdom, Sept. 17, 1971, 43431/71
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8 R **5 Claims**

1. A process for the preparation of a 4,4′-disulphoxydiphenyl-(2-pyridyl)-methane compound of the formula

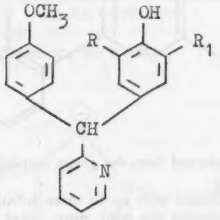


(I)

wherein M is a cation selected from the group consisting of alkali metal, alkaline earth metal, aluminium and non-toxic amine cations and R and R_1, which are the same or different, are hydrogen, halogen, alkyl of 1 – 6 carbon atoms, phenyl, naphthyl, benzyl or phenethyl, which comprises (1) condensing p-methoxyphenyl-(2-pyridyl)-methanol with a phenol of the formula

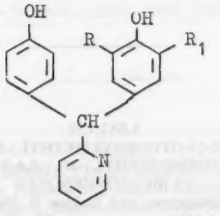


wherein R and R_1 have the same meanings as above, in the presence of sulphuric acid to yield a compound of the formula



(V)

wherein R and R_1 have the same meanings as above, (2) demethylating the compound V to yield an asymetric compound of the formula



(VI)

wherein R and R_1 have the same meanings as above, (3) esterifying the compound VI to yield the dihemisulphate ester and (4) neutralizing the ester with a basic alkali metal compound, alkaline earth metal compound, aluminium compound or a non-toxic amine.

3,882,132

PREPARATION OF 1-ALKYL-1,4-DIHYDRO-7-SUBSTITUTED-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACIDS VIA THE 3-AMINOMETHYL ANALOGS

George Y. Lesher, Schodack, and Monte D. Gruett, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,090

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 B **6 Claims**

1. The process which comprises reacting 1,4-dihydro-4-oxo-7-Q-1,8-naphthyridine with formaldehyde and a lower-secondary amine of the formula R_1R_2NH to produce 1,4-dihydro-3-($R_1R_2NCH_2$)-4-oxo-7-Q-1,8-naphthyridine, reacting the latter with a lower-alkylating agent to produce 1-(lower-alkyl)-1,4-dihydro-3-($R_1R_2NCH_2$)-4-oxo-7-Q-1,8-naphthyridine, and reacting said 1-(lower-alkyl)-3-($R_1R_2NCH_2$) compound with a oxidizing agent capable of converting —$CH_2NR_1R_2$ to —COOH to produce 1-(lower-alkyl)-1,4-dihydro-4-oxo-7-Q-1,8-naphthyridine-3-carboxylic acid, where Q is lower-alkyl, lower-alkanoyloxymethyl, 4(or 3)-pyridyl or 4(or 3)-pyridyl having one or two lower-alkyl substituents, and R_1 and R_2 are each lower-alkyl.

3,882,133

MANUFACTURE OF BIPYRIDYLS

Raymond Frederick Dalton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 6, 1972, Ser. No. 303,957

Claims priority, application United Kingdom, Nov. 15, 1971, 52936/71

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 D **6 Claims**

1. A process for the manufacture of 2,2′-bipyridyl and dimethyl derivatives thereof which comprises heating at a temperature of between 300° and 400°C. pyridine or α, β or γ-picoline with from 2 to 40% of its weight of a halide salt of pyridine or of a quaternised pyridine, the pyridine being selected from pyridine itself, α, β or γ-picoline and 2,2′-dipyridyl and the quaternised group being derived from a member selected from the group consisting of methyl iodide, ethylene dichloride, ethylene dibromide, acetyl chloride, α, α'-dichloroacetone or o-xylylene dibromide and wherein from 2% to 40% of the salt, based on the weight of the pyridine, is used.

3,882,134

1-SUBSTITUTED-3,5-DIPYRIDYL-1,2,4-TRIAZOLES

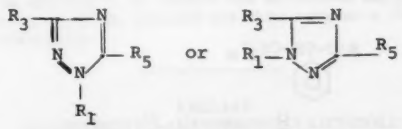
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 21, 1973, Ser. No. 361,914

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 R **10 Claims**

1. A triazole of the formula



wherein

R_1 is a substituted, C_1—C_5 -alkyl having substituents selected from hydroxy, phenyl, chlorophenyl, nitrophenyl, dilower-C_1—C_3—alkylamino

R_3 is pyridyl; and

R_5 is pyridyl.

3,882,135

PROCESS FOR THE PREPARATION OF AMINOPYRIDINES

Richard Garth Pews; Lennon H. McKendry, both of Midland, Mich., and Ralph M. Rodia, Salem, Oreg., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 285,503, Aug. 31, 1972, Pat. No. 3,804,848, and a continuation-in-part of Ser. No. 94,622, Dec. 2, 1970. This application Nov. 1, 1973, Ser. No. 411,944

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 R **8 Claims**

1. A process for the preparation of an aminopyridine compound which comprises reacting a pyridine compound, ring-substituted with at least one displaceable substituent selected from the group consisting of chloro, bromo, fluoro, iodo, $—N^+_2$, $—OSO_2R$, and $—SR^+_2$, wherein each R independently represents hydrogen, phenyl or a loweralkyl radical of from one to about 4 carbon atoms, inclusive, with an alkali metal cyanate in the presence of a high dielectric-aprotic solvent and water.

3,882,136

S-[OMEGA-(1-IMIDAZOLYL) ALKYL]HYDROGEN MONOTHIOSULFATES AND SALTS THEREOF

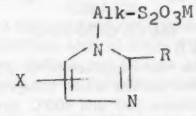
Ernest F. Levon, Evanston, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 16, 1973, Ser. No. 416,382

Int. Cl. C07d *49/36*

U.S. Cl. 260—299 **9 Claims**

1. A compound of the formula



wherein R represents hydrogen, lower alkyl, phenyl, or halophenyl; X represents hydrogen or nitro; Alk represents alkylene containing more than 1 and fewer than 7 carbons; and M represents hydrogen, alkali metal, ammonium, silver, or alkaline earth metal/2.

3,882,137

BIS-HYDANTOIN DIALCOHOLS

Juergen Habermeier, Allschwil; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 80,493, Oct. 13, 1970, Pat. No. 3,726,895. This application June 13, 1972, Ser. No. 262,423

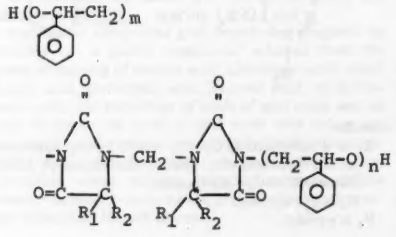
Claims priority, application Switzerland, Nov. 18, 1969, 17105/69

Int. Cl. C07d *49/32*

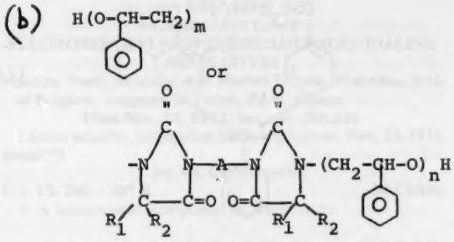
U.S. Cl. 260—309.5 **6 Claims**

1. A dialcohol of the formula

(a)



(b)



wherein R_1 and R_2 is hydrogen, alkyl of 1 to 5 carbon atoms, or where R_1 and R_2 is tetramenthylene or pentamethylene; and A is an alkylene of 1 to 12 carbon atoms or lower alkylene interrupted by one oxygen atom; and m and n each represents an integer having a value of 1 to 30.

3,882,138

OXAZOLE AND OXADIAZOLE BENZOIC ACID DERIVATIVES AS HERBICIDES

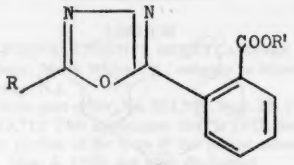
Walter G. Brouwer, Gulph, Ontario; Edwin J. MacPherson, Waterloo, Ontario, both of Canada; Ronald B. Ames, Naugatuck, Conn., and Robert W. Neidermyer, Cheshire, N.H., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Montreal, Canada

Filed Aug. 9, 1971, Ser. No. 170,263

Int. Cl. C07d *85/54*

U.S. Cl. 260—307 G **6 Claims**

1. A chemical having the structural formula



wherein R is selected from the group consisting of

phenyl,

phenyl substituted with up to three substitutents wherein the substitutents are halo, nitro, alkyl having up to 4 carbon atoms or alkoxy having up to 4 carbon atoms,

4-methyl-2-(pyridyl)-5-thiazolyl,

alkyl having up to 6 carbon atoms, and 3-pyridyl;

and R′ is hydrogen, alkali metal, ammonium, or a moiety having up to 12 carbon atoms selected from alkyl, alkynyl and epoxyalkyl.

3,882,139

2-[3-(HYDROXYMETHYL)-5-(PHTHALIMIDOMETHYL)-4H,1,2,4-TRIAZOL-4-YL]BENZOPHENONES

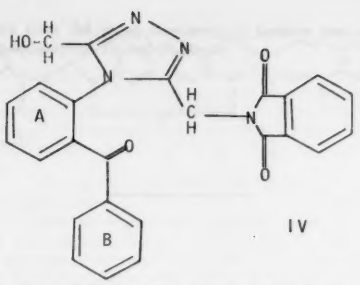
Martin Gail, Kalamazoo, and Jackson B. Hester, Jr., Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 332,293, Feb. 14, 1973, Pat. No. 3,842,090. This application June 19, 1974, Ser. No. 480,978

Int. Cl. C07d *57/00*

U.S. Cl. 260—308 R **10 Claims**

1. A compound of the formula IV:



IV

wherein rings A and B are unsubstituted, or substituted with one or two substituents selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl and nitro.

3,882,140

SALTS OF 2,4,5-TRISUBSTITUTED IMIDAZOLES AND THEIR PREPARATION

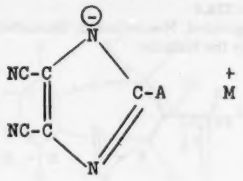
Owen Wright Webster, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 242,199, April 7, 1972, Pat. No. 3,793,339. This application Nov. 5, 1973, Ser. No. 412,701

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **10 Claims**

1. A compound having the formula



wherein

M is a tetra(lower alkyl)ammonium group or a Group I metal and

A is chlorine, bromine, iodine, cyano, nitro or azido.

3,882,141

BENZO-(F)-1,4-THIAZEPINES

Helmut Hagen, Frankenthal; August Amann, Ludwigshafen, and Hubert Giertz, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhein, Germany

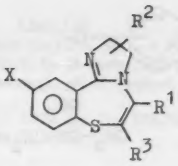
Filed Mar. 27, 1973, Ser. No. 345,308

Claims priority, application Germany, Mar. 30, 1972, 2215606

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **6 Claims**

1. A benzo-(f)-1,4-thiazepine of the formula



(I)

or a pharmacologically compatible acid addition salt thereof in which X is hydrogen, chloro, bromo or lower alkyl of one to seven carbon atoms,

R^1 is lower alkyl of one to four carbon atoms, phenyl, naphthyl or said phenyl and naphthyl which are mono- or di-substituted by halogen, hydroxy, nitro, methoxy, acetylamino or alkyl of 1 to 4 carbon atoms, and

R^2 and R^3 are each hydrogen or lower alkyl of one to four carbon atoms.

3,882,142

1,2-DIALKYL-3,5-DIPHENYL PYRAZOLIUM SALTS

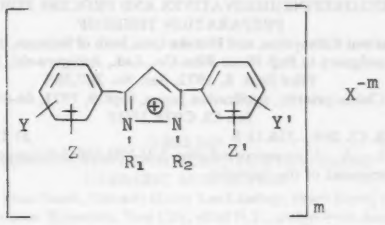
Bryant Leonidas Walworth, Pennington, and Erwin Klingsberg, Mountain Side, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 271,424, July 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 209,448, Dec. 17, 1971, abandoned. This application Nov. 17, 1972, Ser. No. 307,672

Int. Cl. C07 *49/18*

U.S. Cl. 260—311 **7 Claims**

1. A compound having the formula:



wherein R_1 and R_2 each represent lower alkyl of 1 to 4 carbon atoms; Y, Y', Z and Z' each independently represent a member selected from the group consisting of hydrogen; halogen; nitro; alkyl of 1 to 4 carbon atoms; haloalkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; *m* is an integer selected from 1, 2 and 3; and, X represents an anion selected from the group of: acetate, sulfate, hydroxide, hydrogen sulfate, methyl sulfate, benzene sulfonate, a 1 to 4 carbon atom, alkoxybenzene sulfonate; a 1 to 3 carbon atom alkylbenzene sulfonate, nitrate, phosphate, carbonate and alkane sulfonate of 1 to 4 carbon atoms.

3,882,143

4-(2-HYDROXY-3-AMINOPROPOXY)OXINDOLE DERIVATIVES

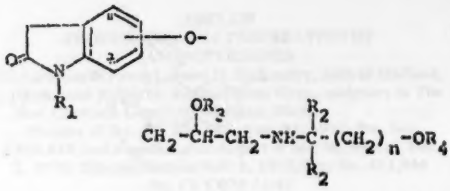
Fritz Seemann, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Dec. 19, 1972, Ser. No. 316,580

Int. Cl. C07d *27/40*

U.S. Cl. 260—325 R **9 Claims**

1. A compound of the formula:



wherein the aminopropoxy side chain is in the 4 or 7 position of the oxindole structure,

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms, both groups R_2 are the same and are each hydrogen or alkyl of 1 to 4 carbon atoms,

n is an integer from 1 to 8, and

R_3 and R_4, which are the same or different, are each hydrogen or the group $-COR_5$,

wherein

R_5 is alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; thienyl; furyl; pyridyl; or tetrahydropyranyl; phenyl; phenylalkyl of 7 to 12 carbon atoms; styryl; or phenyl, phenylalkyl of 7 to 12 carbon atoms or styryl mono substituted, on the phenyl nucleus thereof, by fluorine, chlorine, bromine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

in free base or pharmaceutically acceptable acid addition salt form.

3,882,144

1'-OXOSPIRO(INDOLINE-2,3'-1'H,3H'-2-BENZOXEPINE)DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Harumi Katsuyama, and Histake Ono, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-shi, Japan

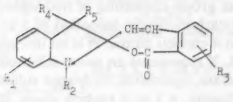
Filed Sept. 8, 1972, Ser. No. 287,385

Claims priority, application Japan, Sept. 9, 1971, 46-69852

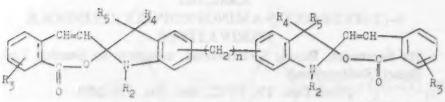
Int. Cl. C07d *27/38*

U.S. Cl. 260—326.11 S **37 Claims**

1. A 1'-oxospiro(indoline-2,3'-1'H,3H'-2-benzoxepine) compound of the formula:

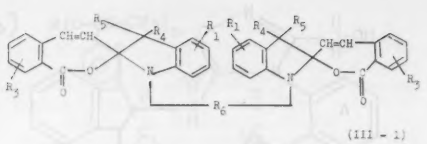


(I - 1)



(II - 1)

or



(III - 1)

wherein R_1 is a hydrogen atom, a halogen atom, a nitro group, an alkyl group containing from 1 to 3 carbon atoms, an alkoxyl group containing from 1 to 3 carbon atoms, or an alkoxycarbonyl group containing from 2 to 4 carbon atoms;

R_2 is an alkyl group or an aralkyl group represented by the formula $-CH_2-X$, in which X is a hydrogen atom, a hydroxyl group, a cyano group, a nitro phenyl group, a carboxyl group, or an alkoxycarbonyl group containing from 2 to 4 carbon atoms and m is an integer of from 1 to 4;

R_6 is an alkylene chain containing from 1 to 5 carbon atoms or a xylylene group;

R_3 is a hydrogen atom, a halogen atom or a nitro group;

R_4 and R_5 each is an alkyl group having from 1 to 3 carbon atoms; and

n is 0 or an integer of 1 or 2.

3,882,145

HALOGENATED N-SUBSTITUTED THIOCARBOXY MALEIMIDES

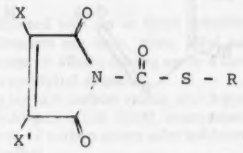
William E. Bissinger, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 22, 1972, Ser. No. 317,571

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.4 **5 Claims**

1. A halogenated N-substituted thiocarboxy maleimide represented by the formula:



where X is halogen; X' is halogen or H; and R is alkyl, alkenyl, cycloalkyl, cycloalkenyl, haloalkyl, haloalkenyl, phenyl, alkyl phenyl, alkoxyphenyl or halophenyl containing 12 carbon atoms or less.

3,882,146

PROCESS FOR PREPARING PYRRYL-2-ACETONITRILES

Karl E. Wiegand, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 30, 1973, Ser. No. 355,785

Int. Cl. C07d *27/22*

U.S. Cl. 260—326.62 **4 Claims**

1. In a process for producing pyrryl-2-acetonitriles comprising reacting a 2-(N,N-dialkylaminomethyl)-pyrrole with an alkylating agent to form a quaternary salt and further reacting the quaternary salt with an aqueous alkali metal cyanide solution, the improvement comprising carrying out the process homogeneously in a reaction medium which is an inert solvent

selected from the group consisting of ketones and ethers having up to about 10 carbon atoms.

3,882,147

3-HYDROXY-3-(3,4-METHYLENEDIOXYPHENYLALKYL-3,4-DIHYDRO-2H-1,5-BENZODIOXEPIN PRODUCTS

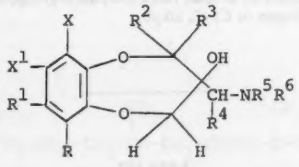
Burton K. Wasson, Valois, and Haydn W. R. Williams, Dollard Des Ormeaux, Quebec, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 249,422, May 1, 1972, Pat. No. 3,812,150, which is a division of Ser. No. 832,879, June 9, 1969, Pat. No. 3,700,691, which is a continuation-in-part of Ser. No. 755,442, Aug. 26, 1968, abandoned. This application Nov. 21, 1973, Ser. No. 417,870

Int. Cl. C07d *13/00*

U.S. Cl. 260—340.5 **7 Claims**

1. A 3,3-disubstituted -benzodioxepin having the structure



and acid addition salts thereof wherein

R is selected from hydrogen, hydroxy, lower alkyl and lower alkoxy;

R^1 is selected from hydrogen, chloro, bromo, lower alkyl, nitro, amino, C_{1-3} alkylsulfonylamino, C_{1-3} alkoxycarbonylamino, lower carbalkoxyamino, hydroxy and lower alkoxy;

X and X^1 are selected from hydrogen, lower alkyl and halogen;

R^2 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkyl and lower cycloalkyl;

R^3 is selected from hydrogen, lower alkyl, phenyl and phenyl-lower alkyl;

R^4 is selected from hydrogen and lower alkyl;

R^5 is selected from hydrogen, lower alkyl, and 2-phenyl-2-hydroxyethyl;

R^6 is 3,4-methylenedioxyphenyl-lower alkyl.

3,882,148

CHROME COMPOUNDS HAVING SRS—A PROPERTIES

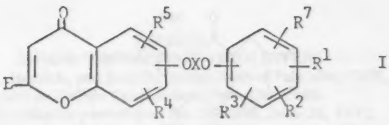
Joachim Augstein, Lindford; David Carter, and Thomas Brian Lee, both of Loughborough, all of England, assignors to Fisons Limited

Filed July 31, 1972, Ser. No. 276,798

Int. Cl. C07d *7/34*

U.S. Cl. 260—345.2 **25 Claims**

1. A compound of the formula



wherein

X is a straight chain alkylene group containing from 3 to 7 carbon atoms and is unsubstituted or is substituted by one hydroxy group, E is a carboxy group and

R_1, R_2 and R_3 may be the same or different and are hydrogen, hydroxy, methoxy, benzyloxy, acetyl, acetylamino, allyl or propyl and

R_4 is hydrogen, allyl or propyl,

and pharmaceutically acceptable salts thereof.

3,882,149

SUBSTITUTED BENZOFURANYL ETHYLIDENE CARBAZIC ACID ESTERS

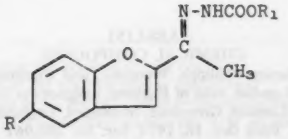
John Paul Dusza, Nanuet; Harry Lee Lindsay, Pearl River, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 17, 1973, Ser. No. 425,423

Int. Cl. C07d *5/42*

U.S. Cl. 260—346.2 R **3 Claims**

1. A compound of the formula:



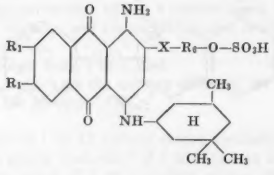
wherein R is selected from the group consisting of hydrogen and chlorine, and R_1 is alkyl C_1–C_4.

3,882,150
ANTHRAQUINONE COMPOUNDS

Wolfgang Frey, Munchenstein Basel-Land, and Wolfgang Schoenauer, Riehen/BS, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 808,322, March 18, 1969, Pat. No. 3,646,071. This application Nov. 17, 1971, Ser. No. 199,810
Claims priority, application Switzerland, Apr. 8, 1968, 5122/68; May 31, 1968, 8169/68; Sept. 30, 1968, 14593/68
Int. Cl. C07c *97/14*
U.S. Cl. 260—380 6 Claims

1. A compound of the formula



wherein

one R_1 is hydrogen, fluorine, chlorine or bromine or a $-SO_3H$-group and the other R_1 is hydrogen, or each R_1 is chlorine,

R_6 is $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-$,

or $-CH_2-CH_2-(O-CH_2-CH_2)_p-$,

X is —O— or —S—, and

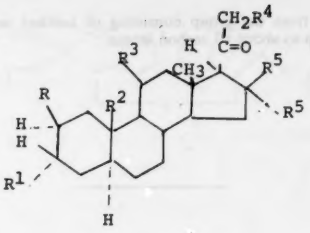
p is 1 to 9.

3,882,151
CHEMICAL COMPOUNDS

Gordon Hanley Phillipps, Wembley, and Christopher Earle Newall, London, both of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed Dec. 16, 1971, Ser. No. 208,961
Claims priority, application United Kingdom, Dec. 17, 1970, 60065/70
Int. Cl. C07c *167/00*
U.S. Cl. 260—397.45 13 Claims

1. A [3α-oxygenated pregnane-21-ether having the general] compound of the formula



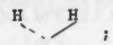
wherein:

R is hydrogen, halogen, C_1–C_6 alkanoyloxy, C_1–C_6 alkoxy, C_1–C_6 aklylthio, C_1–C_5 alkyl or thiocyanato;''

R^1 is hydroxy or an alkanoyloxy group of up to 5C atoms or such a group substituted by at least one halogen atom or carboxy or amino group;

R^2 is hydrogen or methyl;

R^3 is oxygen or



R^4 is a C_1–C_6 alkoxy, C_5–C_8 cycloalkoxy, phenyl (C_1–C_6) alkoxy or phenoxy group or such a group substituted by at least one halogen atom or a carboxyl, C_1–C_6 alkoxycarbonyl, C_1–C_6 alkoxy or cyano group or an amino group of the formula NR^aR^b where R^a and R^b which may be the same or different are H or C_1–C_4 alkyl or NR^aR^b represents a piperazino or morpholino group or such a group substituted by at least one C_1–C_4 alkyl group; and

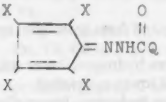
R is hydrogen or C_1–C_6 alkyl.

3,882,152
BETA CYCLOPENTADIENYL HYDRAZIDES AND CARBAZATES

Dale D. Dixon, Kutztown, and Joseph V. Urenovitch, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed Sept. 9, 1970, Ser. No. 70,883
Int. Cl. C07c *125/00*
U.S. Cl. 260—468 E 2 Claims

1. Compound corresponding to a structure



wherein each X is independently selected from F, Cl, Br and I and wherein Q is a C_1–C_6 alkoxy radical.

3,882,153
METHOD FOR RECOVERING FLUORINATED CARBOXYLIC ACID

Shigeru Seki, and Koji Sato, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 70,916, Sept. 9, 1970, abandoned. This application Apr. 4, 1973, Ser. No. 347,665
Claims priority, application Japan, Sept. 12, 1969, 44-72483
Int. Cl. C07c *51/42;* **C08f** *1/88*
U.S. Cl. 260—408 **5 Claims**

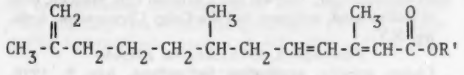
1. A method for recovering a fluorinated carboxylic acid from a dilute aqueous solution, which comprises contacting a weak basic anion exchange resin with a dilute aqueous solution of a fluorinated carboxylic acid of the formula X —CYZ-$CF_2)_n$COOM, where X is H, Cl, F, CF_3, or CF_2CL; Y is H or F; Z is H, Cl, or F; M is H, NH_4, K or Na; and n is an integer of 2 to 6, and containing a total of 5–13 carbon atoms in the X —CYZ-$CF_2)_n$ group to adsorb the fluorinated carboxylic acid onto the basic anion exchange resin, and then contacting the anion exchange resin with an aqueous solution of NH_3 as an eluent to transfer the fluorinated carboxylic acid from the anion exchange resin into the eluent to isolate the fluorinated carboxylic acid; said weak basic anion exchange resin (a) containing at least one amine group, as an exchange group selected from primary, secondary and tertiary amines, and (b) having a pH in the range of 0 to 7.0

3,882,154
ESTERS OF 3,7,11 -TRIMETHYLDODECA-2,4,11-TRIENOIC ACID

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 9, 1972, Ser. No. 305,042
Int. Cl. C07c *153/07;* **A01n** *9/24*
U.S. Cl. 260—410 **7 Claims**

1. A compound selected from those of the following formula:



wherein, R′ is lower alkyl, cycloalkyl of three to eight carbon atoms, or lower alkynyl.

3,882,155
PROCESS FOR SYNTHESIZING SPECIFIC COMPLETE MIXED POLYOL ESTERS

Harry Whitney Wharton, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 12, 1973, Ser. No. 415,034
Int. Cl. C07c *67/00*
U.S. Cl. 260—410.7 **16 Claims**

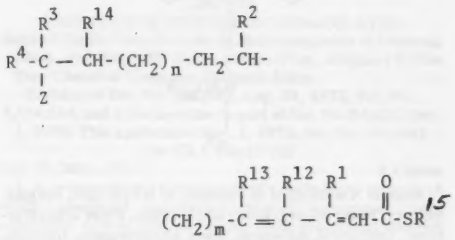
1. A process for preparing specific complete mixed polyol esters from partial polyol esters with substantially no ester group rearrangement comprising esterifying a partial polyol ester with an acid anhydride in the presence of a catalytic amount of 2,4,6-trinitrobenzene sulfonic acid, said partial polyol ester being selected from the group consisting of partial polyol esters from saturated aliphatic diols having the hydroxyl groups unsymmetrically substituted with respect to the carbon chain and partial polyol esters from saturated aliphatic polyols containing at least three hydroxyl groups.

3,882,156
DI- AND TRI-OLEFINIC THIOLESTERS

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 266,030, June 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 206,174, Dec. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 187,897, Oct. 8, 1971, Pat. No. 3,755,411, which is a continuation-in-part of Ser. Nos. 111,650, Feb. 1, 1971, Pat. No. 3,729,486, and Ser. No. 111,702, Feb. 1, 1971, abandoned, and Ser. No. 111,765, Feb. 1, 1971, abandoned, and Ser. No. 111,766, Feb. 1, 1971, abandoned, and Ser. No. 111,770, Feb. 1, 1971, abandoned, and Ser. No. 115,725, Feb. 16, 1971, Pat. No. 3,706,733. This application Nov. 1, 1972, Ser. No. 302,982
Int. Cl. C07c *153/01*
U.S. Cl. 260—455 R **29 Claims**

1. A compound selected from those of the formula:



wherein,

m is zero or the positive integer one;

n is zero or the positive integer one or two;

Z is chloro or the group —OR in which R is hydrogen, lower alkyl or hydrocarbon carboxylic acyl of one to three carbon atoms;

each of R^1, R^2 and R^3 is methyl or ethyl; R^4 is lower alkyl; each of R^{12}, R^{13} and R^{14} is hydrogen or methyl; and

R^{15} is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl of three to eight carbon atoms, aryl of six to 12 carbon atoms, or aralkyl of seven to 12 carbon atoms.

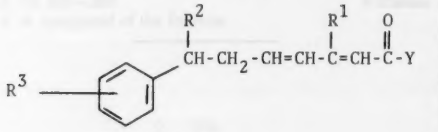
3,882,157

THIOLESTERS OF PHENYLHEPTADIENOIC ACIDS

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 275,646, July 27, 1972, Pat. No. 3,845,089. This application June 10, 1974, Ser. No. 477,573
Int. Cl. C07c *153/01*
U.S. Cl. 260—455 R 9 Claims

1. A compound selected from those of the formula:



wherein,
each of R^1 and R^2 is lower alkyl;
R^3 is lower alkyl, chloro, the group —OR or the group —SR in which R is hydrogen or lower alkyl; and
Y is lower alkylthio.

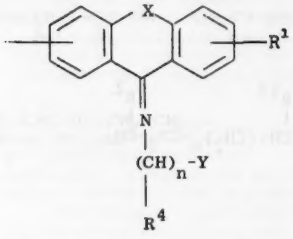
3,882,158

TRICYCLIC IMINES

Philippe Dostert, Basel, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 184,901, Sept. 29, 1971, Pat. No. 3,803,234. This application Jan. 14, 1974, Ser. No. 433,319
Claims priority, application Switzerland, Oct. 9, 1970, 14972/70
Int. Cl. C07c *143/68*
U.S. Cl. 260—456 A 2 Claims

1. A compound of the formula



wherein X is ethylene or vinylene; R^1 is hydrogen, halogen, hydroxy, lower alkoxy, lower alkyl, cyano, lower alkoxycarbonyl, carbamoyl, sulfamoyl, lower alkylmercapto, trifluoromethyl or nitro; R^4 is hydrogen or lower alkyl; *n* is an integer from 2 to 5; and Y is phenylsulfonyloxy or phenylsulfonyloxy substituted by lower alkyl or halogen.

3,882,159

REACTIVATION OF MOLYBDENUM CONTAINING OXIDATION CATALYSTS IN FLUID BED REACTORS

James L. Callahan, Bedford Heights; Wilfrid G. Shaw, and Arthur F. Miller, both of Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Aug. 20, 1973, Ser. No. 390,175
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 5 Claims

1. In the process for the ammoxidation of propylene at a temperature of about 200° to about 600°C. in a fluid-bed reactor using a fluid-bed ammoxidation catalyst containing molybdenum to produce acrylonitrile wherein said ammoxidation catalyst has become partially deactivated by loss of molybdenum, the improvement comprising regenerating the ammoxidation catalyst at reaction temperatures in the presence of air, steam or mixture thereof by contacting the ammoxidation catalyst with fluid-bed particles consisting of (a) an essentially inert support giving less than 25% conversion of the propylene and (b) molybdenum oxide.

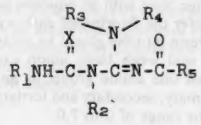
3,882,160

CARBAMATES AND THIOLCARBAMATES

Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. du Pont de Nemours Company, Wilmington, Del.

Continuation-in-part of Ser. No. 312,904, Dec. 7, 1972, Pat. No. 3,823,179. This application May 2, 1973, Ser. No. 356,422
Int. Cl. C07c *129/12*
U.S. Cl. 260—468 E 4 Claims

1. A compound having the following formula



wherein
R_1 is selected from a C_4–C_8 cycloalkyl substituted with 0–1 C_2–C_4 alkyl, 0–2 methyl groups, 0–2 chlorine or bromine atoms, or 0–1 methoxy or ethoxy group; a C_5–C_8 cycloalkenyl; a C_6–C_8 cycloalkylmethyl or cycloalkenylmethyl; a C_7–C_{10} bicycloalkyl or bicycloalkenyl; a C_8–C_{11} bicycloalkylmethyl or bicycloalkenylmethyl; trimethylcyclohexyl; tetramethylcyclohexyl;
R_2 is a C_1–C_3 alkyl;
R_3 is hydrogen, methyl, or ethyl;
R_4 is a C_1–C_4 alkyl, a C_3–C_4 alkenyl, a C_3–C_4alkenyl;
R_5 is —OR_6,
wherein R_6 is a C_1–C_8 alkyl substituted with 0—3 chlorine atoms or 0–1 methoxyl; and
X is oxygen.

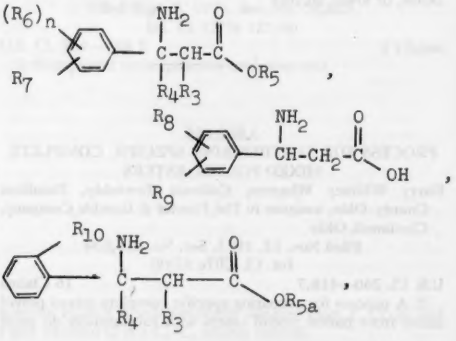
3,882,161

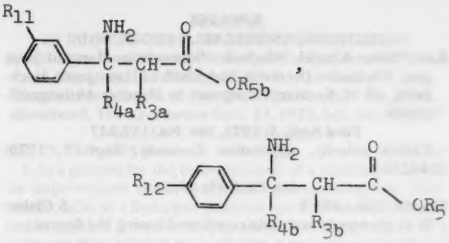
BETA-PHENYLPROPIONIC ACIDS AND ESTERS

Kurt Eichenberger, Therwil, and Christian Egli, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,444
Claims priority, application Switzerland, Apr. 9, 1970, 5273/70; July 16, 1970, 10817/70; Mar. 2, 1971, 3065/71
Int. Cl. C07c *101/18*
U.S. Cl. 260—471 A 7 Claims

1. A member selected from the group consisting of a compound of the formulae





wherein R_5 is hydrogen or a lower alkyl group, each of the radicals R_3 and R_4 denotes hydrogen or a lower alkyl group and R_6 stands for lower alkoxy, n is 1,2 or 3 and R_7 is a member selected from the group consisting of lower alkenyloxy and lower alkyl and, when n stands for 3 or when *n* stands for 2 and at least one of the symbols R_3, R_4 and R_5 stands for lower alkyl, hydrogen, R_8 and R_9 represent lower alkoxy groups standing in a position higher or lower than the 4-position, R_{10} stands for lower alkoxy and R_{5a} for a member selected from the group consisting of lower alkyl and, when R_{10} contains at least two carbon atoms, hydrogen, R_{11} stands for lower alkoxy and R_{3a} for hydrogen or lower alkyl and one of the symbols R_{3a} and R_{5b} stands for hydrogen or lower alkyl and the other for a member selected from the group consisting of, lower alkyl and, when R_{5b} stands for lower alkyl having more or less than 2 carbon atoms, hydrogen, R_{12} stands for lower alkoxy, R_{4b} for hydrogen or lower alkyl and R_{3b} stands for a member selected from the group consisting of lower alkyl and, when R_{12} contains more than 2 carbon atoms, hydrogen, and a non-toxic pharmaceutically usable salt thereof.

3,882,162
PROCESS FOR MAKING A C1–C7 ALIPHATIC HYDROCARBYL ESTER OF AN N-[2,6-DI(C1–C7 ALKYL)PHENYL] ALPHA-AMINOCARBOXYLIC ACID

Anthony B. Clayton, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 11, 1973, Ser. No. 405,610
Int. Cl. C07c *101/44*
U.S. Cl. 260—471 A **7 Claims**

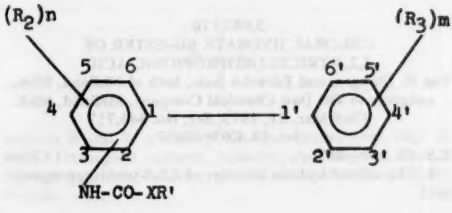
1. A process for synthesizing a C_1–C_7 aliphatic hydrocarbyl ester of an N-[2,6-di(C_1–C_7 alkyl)phenyl] α-aminocarboxylic acid from the corresponding 2,6-di(C_1–C_7alkyl)aniline and the corresponding chlorocarboxylic acid ester, which comprises effecting with a catalytic quantity of 2,6-(C_1–C_7 alkyl-)aniline hydrochloride reaction of said aniline and said ester.

3,882,163
URETHANE DERIVATIVES OF POLYMETHYL BIPHENYL

Imre Puskas, Glen Ellyn, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Jan. 24, 1972, Ser. No. 220,368
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **11 Claims**

1. A urethane derivative of polymethylbiphenyl having the following formula:



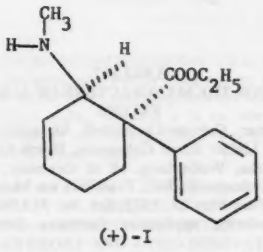
wherein the NH—CO—XR′ occupies the two or three position on the phenyl ring, and wherein X is oxygen, R′ is a lower alkyl, or phenyl radical and R_2 and R_3 are methyl groups and *n* and *m* are integers having values from 2 through 4 inclusive.

3,882,164
DEXTROROTATORY 3r-N-MONOMETHYL-AMINO-4c-HENYL-4t-ETHOXYCARBONICYCLOHEXENE-1 AND PROCESS FOR THE PRODUCTION THEREOF

Gerhard Satzinger; Wolfgang Herrmann, both of Denzlingen, and Manfred Herrmann, Gundelfingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 266,036, June 26, 1972, abandoned. This application July 5, 1973, Ser. No. 376,845
Int. Cl. C07c *101/14*
U.S. Cl. 260—471 A **6 Claims**

1. A compound of formula (+)-I



(+)-I

which is (+)-3r-N-monomethylamino-4c-phenyl-4t-ethoxycarbonylcyclohexene-1, the hydrochloride, D-(−)-O,O-dibenzoyltartrate L-(+)-O,O-dibenzoyltartrate or other medically acceptable acid addition salts thereof.

3,882,165
PROCESS FOR PREPARING CARBANILATES

Richard Garth Pews; Lennon H. McKendry, both of Midland, Mich., and Ralph M. Rodia, Salem, Oreg., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 285,503, Aug. 31, 1972, Pat. No. 3,804,844, and a continuation-in-part of Ser. No. 94,622, Dec. 2, 1970. This application Nov. 1, 1973, Ser. No. 411,943
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **8 Claims**

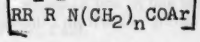
1. A process for the preparation of a carbanilate compound which comprises reacting a phenyl compound, ring-substituted with at least one displaceable substituent selected from the group consisting of chloro, bromo, fluoro, iodo; $-N_2^+—OSO_2R$, $—SO_2R$, and $—SR_2^+$, wherein each R independently represents hydrogen, phenyl or a loweralkyl radical of from one to about 4 carbon atoms, inclusive, with an alkali metal cyanate in the presence of a high dielectric-aprotic solvent and an alkanol.

3,882,166
ANTIMICROBIAL QUATERNARY AMMONIUM COMPOUNDS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 10, 1972, Ser. No. 242,750
Int. Cl. C07c *101/42*
U.S. Cl. 260—479 S **6 Claims**

1. A chemical compound having the structural formula:



wherein R is a long chain alkyl group of 12–18 carbon atoms, R^1 and R^2 are methyl or ethyl groups; *n* is an integer from 1–6; Ar is a substituted aryl radical selected from the group consisting of phenyl and naphthyl, said substituted moiety being selected from the group consisting of tri-halo- and mono-nitro-radicals; and X is an anion selected from the class consisting of halides, sulfates and methosulfates.

3,882,167

PROCESS FOR THE MANUFACTURE OF ACRYLIC ACID ESTERS

Elmar Lohmar, Cologne-Lindenthal; Alexander Ohorodnik, Erftstadt, Liblar; Klaus Gehrmann, Hurth-Knapsack, and Paul Stutzke, Walberberg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 25, 1973, Ser. No. 363,863

Claims priority, application Germany, June 2, 1972, 2226829

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **11 Claims**

1. A process permitting heterogeneous catalytic reactions to be carried out continuously in liquid phase, wherein a suspension of liquid starting material and fine particulate catalyst together with resulting reaction product is continuously conveyed upwardly in a reaction zone, in accordance with the principle underlying an air-lift pump, by the introduction of a gas into, near the bottom of, the reaction zone, and recycled downwardly through a by-pass reflux line to the bottom of the reaction zone, the recycled liquid material passing through an injector system interrupting its flow, the said system being situated in the by-pass reflux line in a closed catalyst-separating zone containing reaction product; wherein, following establishment of the reaction equilibrium, starting material is continuously supplied to the reaction zone and crude, catalyst-free reaction product is removed near the head of the catalyst-separating zone; wherein reaction product, which is to be removed from the catalyst-separating zone, is caused to flow upwardly through the catalyst-separating zone with the injector system therein towards the reaction product outlet at a velocity smaller than the sedimentation velocity of the catalyst in the catalyst-separating zone under the operational conditions prevailing; which process comprises esterifying acrylic acid in contact with an acid ion exchanger as a catalyst, at elevated temperature and under pressures substantially between 0.01 and 1 atmosphere absolute by continuously supplying the reaction zone with a starting mixture of acrylic acid and an alkanol having between 4 and 6 carbon atoms; introducing an inert gas into, near the bottom of, the reaction zone; heating the resulting suspension to boiling; distilling off, in a distillation zone placed directly above the head of the reaction zone, an azeotropic mixture of water originating from the esterification, alkanol and/or ester; condensing the said azeotropic mixture and separating it into a specifically lighter, predominantly organic phase and into a specifically heavier, predominantly aqueous phase, the organic phase being recycled to the head of the distillation zone and/or to the reaction zone; and discharging resulting crude alkyl acrylate, near the head of the catalyst-separating zone.

3,882,168

PHOTOPOLYMERIZABLE COMPOUNDS

Kurt-Walter Klupfel, Wiesbaden-Sonnenberg; Hartmut Steppan, Wiesbaden-Dotzheim, and Manfred Hasenjager, Hochheim, all of Germany, assignors to Hoechst Aktiengesellschaft

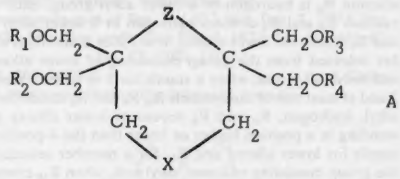
Filed Sept. 3, 1971, Ser. No. 177,847

Claims priority, application Germany, Sept. 7, 1970, 2044233

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **5 Claims**

1. A photopolymerizable compound having the formula



A

in which

X is selected from the group consisting of a single bond, an oxygen atom and a $—CH_2—$ group,

Z is selected from the group consisting of —CO— and —CHOH— groups, and

R_1, R_2, R_3, and R_4 are selected from the group consisting of hydrogen and acryloyl or methacryloyl groups,

Z is a carbonyl group if X is a single bond and, on an average, at least one of the groups R_1, R_2, R_3, and R_4 is an acryloyl group.

3,882,169

1,2,2,2,-TETRACHLORETHYL ACRYLATE AND METHACRYLATE

Frantisek Hrabak, and Milos Vacek, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved No. 3 Narodni, Prague, Czechoslovakia

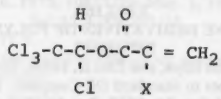
Filed Oct. 27, 1972, Ser. No. 301,275

Claims priority, application Czechoslovakia, Oct. 28, 1971, 7599-71; Oct. 28, 1971, 7600-71

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 H **13 Claims**

1. A 1,2,2,2-tetrachloroethyl ester compound of the formula



wherein X is hydrogen, chlorine or methyl.

3,882,170

CHLORAL HYDRATE BIS-ESTER OF 2,2,3-TRICHLOROPROPIONIC ACID

Yog R. Dhingra, and Zdravko Jezic, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1973, Ser. No. 343,717

Int. Cl. C07c *69/62*

U.S. Cl. 260—487 **1 Claim**

1. The chloral hydrate bis-ester of 2,2,3-trichloropropionic acid.

3,882,171
HYDROGENATION OF NITROBENZOIC ACIDS

Joseph Levy, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 132,168, April 21, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,309
Int. Cl. C07c *101/54, 101/56*
U.S. Cl. 260—518 R 10 Claims

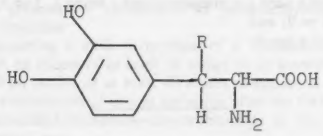
1. In a process for the hydrogenation of a nitrobenzoic acid, the improvement which comprises hydrogenating said nitrobenzoic acid at a hydrogen pressure less than about 100 psig. and at a pH of from about 5 to about 7 in the presence of a hydrogenation catalyst in a solution consisting essentially of said acid dissolved in an aqueous solution of from about 0.95 to about 1.0 equivalents of an alkali metal hydroxide, carbonate or bicarbonate.

3,882,172
β-SUBSTITUTED-DIHYDROXYPHENYL-ALANINES

John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed June 26, 1973, Ser. No. 373,801
Int. Cl. C07c *101/72*
U.S. Cl. 260—519 2 Claims

1. A compound of the formula



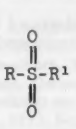
in which R is a cycloalkyl of three to eight carbon atoms, and pharmaceutically acceptable salts thereof.

3,882,173
PREPARATION OF MONOHALOACYL HALIDES

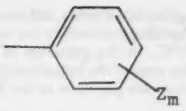
Virgil W. Gash, and Donald E. Bissing, both of Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 19, 1973, Ser. No. 380,785
Int. Cl. C07c *51/58, 53/20*
U.S. Cl. 260—544 Y 21 Claims

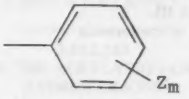
1. A process for the preparation of a monohaloacyl halide which comprises reacting a ketene selected from the group consisting of unsubstituted ketene, methyl ketene, dimethyl ketene, ethyl ketene, diethyl ketene, phenyl ketene and diphenyl ketene and a halogenating agent selected from the group consisting of chlorine, bromine, iodine, iodine monochloride, iodine monobromide and bromine monochloride in the presence of a sulfone of the formula



wherein R and R^1 are independently selected from alkyl of from 1 through 8 carbons, inclusive, cycloalkyl of from 5 through 6 carbons, inclusive, phenyl, substituted phenyl of the formula



wherein each Z is independently halo, trihalomethyl, cyano, nitro, lower alkyl or lower alkoxy, and *m* is an integer from 1 through 3, inclusive, provided that when each Z is nitro, *m* cannot exceed 2, and substituted alkyl of the formula $-C_xH_{2x-y+1}R$ y wherein R^2 is halo, phenyl, or substituted phenyl of the formula



wherein Z and *m* are defined hereinbefore, *x* is an integer from 1 through 8, inclusive, and *y* is an integer from 1 through 3, inclusive, or R and R^1 when taken together are alkylene of the empirical formula C_nH_{2n} wherein *n* is an integer from 3 through 10, inclusive, and having from 3 through 8 carbons, inclusive, in a continuous chain.

3,882,174
AMIDES OF 4-(4′-BIPHENYLYL)-BUTYRIC ACID AND ITS 4-HYDROXY AND 4-OXO DERIVATIVES

Ernst Seeger; Wolfhard Engel; Josef Nickl; Helmut Teufel, and Gunther Engelhardt, all of Biberach/Riss, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

Filed Aug. 21, 1972, Ser. No. 282,363
Claims priority, application Germany, Aug. 20, 1971, 2141925; Aug. 20, 1971, 2141926; Aug. 20, 1971, 2141927
Int. Cl. C07c *103/30*
U.S. Cl. 260—558 R 8 Claims

1. A compound selected from the group consisting of 4-(4′-biphenylyl)-4-oxo-butyric acid amide, 4-(2″-amino-4′-biphenylyl)-4-oxo-butyric acid amide, 4-(3″-chloro-4′-biphenylyl)-4-oxo-butyric acid amide, 4-(4′-biphenylyl)-4-hydroxy-butyric acid amide, 4-(2″-amino-4′-biphenylyl)-4-hydroxy-butyric acid amide, 4-(2″-fluoro-4′-biphenylyl)-butyric acid p-hydroxy-anilide 4-(2″-fluoro-4′-biphenylyl)-butyric acid o-hydroxy-anilide and non-toxic, pharmacologically acceptable acid addition salts thereof.

3,882,175
PROCESS FOR THE PREPARATION OF N,N-DIALKYLFORMAMIDES

Naoya Kominami; Yohei Fukuuoka, and Katuyoshi Sasaki, all of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1971, Ser. No. 174,923
Claims priority, application Japan, Aug. 29, 1970, 45-75271; Dec. 15, 1970, 45-111225; Dec. 15, 1970, 45-111226
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 R 1 Claim

1. In the process for the preparation of an N,N-dialkylformamide by reacting hydrocyanic acid with an alcohol represented by the formula:

ROH

wherein R represents an alkyl group having 1 to 4 carbon atoms, and in the presence of a titanium compound selected from the group consisting of titanium hydroxides, titanium oxides, titanium halides, titanium sulfates, titanium nitrates, titanium alkoxides, titanium oxalates, ammonium and amine

salts of hexahalogenotitanic acids and mixtures thereof, the improvement comprising conducting the reaction at temperatures of 150°–270°C., in the presence of water, said water being present at the time of the initiation of the reaction in the amount of 0.5–2.0 moles per mole of the hydrocyanic acid.

3,882,176

N-TRIFLUOROACETYL AMIDOXIME-O-CARBAMATES AND THEIR USE AS ANTIHYPERTENSIVE AGENTS IN WARM-BLOODED ANIMALS

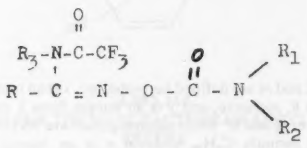
Jerome Ferdinand Deye, Philadelphia, Pa., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 10, 1973, Ser. No. 404,918

Int. Cl. C07c *103/30*

U.S. Cl. 260—561 HL **7 Claims**

1. Compounds of the formula



where

R is an aliphatic hydrocarbon of from 3 through 12 carbon atoms,

R_1 and R_2 are each independently hydrogen or lower alkyl of from 1 through 3 carbon atoms, provided, however, that the sum of carbon atoms in R_1 and R_2 does not exceed 3,

R_3 is hydrogen or alkyl of from 1 through 6 carbon atoms, and

pharmaceutically acceptable salts of these compounds.

3,882,177

PROCESS FOR THE PREPARATION OF DL-THREO-1-(P-NITRO-PHENYL)-2-ACETAMINO-1,3-PROPANEDIOL

Aurel Ujhidy; Laszlo Szotyori; Janos Szepvolgyi, all of Veszprem; Karoly Horvath, Budapest; Ferenc Nagy, Budapest; Istvan Orban, Budapest, and Istvan Simonyi, Budapest, all of Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed May 7, 1973, Ser. No. 357,718

Claims priority, application Hungary, May 12, 1972, EE 2024

Int. Cl. C07c *97/16*

U.S. Cl. 260—562 CL **4 Claims**

1. A process for the preparation of DL-threo-1-(p-nitrophenyl)-2-acetamino-1,3-propanediol from the isopropanol solution of DL-threo-1-(p-nitrophenyl)-2-acetamino-1,3-propanediol - aluminium alcoholate compounds formed in the Meerwein-Ponndorf-Verley reduction of p-nitro-α-acetamino-β-hydroxy-propio-phenone, comprising hydrolyzing said aluminum alcoholates in the presence of 50–100% of the calculated amount of water, water vapor or an equivalent amount of aqueous mineral acid solution, simultaneously with or subsequent to said hydrolysis evaporating isopropanol continuously, then dissolving aluminum oxide in the form of its doulbe salt from the residual powdery mixture of DL-threo-1-(p-nitrophenyl)-2-acetamino-1,3-propanediol is a solvent system selected from the group consisting of an aqueous solution of alkali metal sulfate and sulfuric acid at a pH of about 6 and a temperature no higher than 30°C. and an aqueous solution of alkali metal hydroxide and alkali metal carbonate, and then separating said DL-threo-1-(p-nitrophenyl)-2-acetamino-1,3-propanediol from the reaction mixture.

3,882,178

FLUORINATED TERTIARY AMINO ETHERS

Siegfried Benninger, Schwalbach, Taunus; Siegfried Rebsdat, Neuotting, and Rudolf Kohlhaas, Fischbach, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

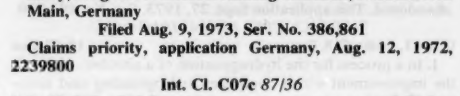
Filed Aug. 9, 1973, Ser. No. 386,861

Claims priority, application Germany, Aug. 12, 1972, 2239800

Int. Cl. C07c *87/36*

U.S. Cl. 260—563 R **16 Claims**

1. A compound of the formula



(I)

where

R_{F1} and R_{F2} each are linear or branched perfluoro-alkyl radicals having from one to 10 carbon atoms or perfluoro-cyclo-alkyl radicals having from four to 10 carbon atoms

R_3 is CF_3 or F;

R_4 is H or F;

x, y and z each are integers; x and y being 1, 2 or 3; z being 0, 1 or 2; and

$x + y + z$ are 6.

3,882,179

1-VERATRYLAMINO-4-T-BUTYLCYCLOHEXYLAMINE HYDROCHLORIDE

Thomas J. Schwam, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,461

Int. Cl.-C07c *87/28*

U.S. Cl. 260—570.9 **1 Claim**

1. 1-Veratrylamino-4-t-butylcyclohexylamine hydrochloride.

3,882,180

TRIFLUOROMETHYL-SUBSTITUTED AROMATIC ACIDS

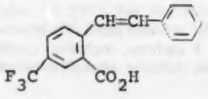
Edward L. Engelhardt, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

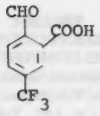
Division of Ser. No. 864,907, Oct. 8, 1969, Pat. No. 3,714,239, which is a division of Ser. No. 553,656, May 31, 1966, Pat. No. 3,499,037. This application July 19, 1972, Ser. No. 273,090

Int. Cl. C07c *63/12*, *63/60*, *65/18*

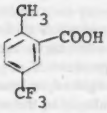
U.S. Cl. 260—515 A **4 Claims**

1. A trifluoromethyl substituted benzoic acid compound having a structural formula selected from the group consisting of





and



3,882,181
PRODUCTION OF AMINES AND DIAMINES

Denis Forster, University City, and Virgil W. Weiss, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 2, 1971, Ser. No. 177,908
Int. Cl. C07c *85/04, 85/16*
U.S. Cl. 260—583 N **6 Claims**

1. A process for production of hexamethylenediamine which comprises

a. contacting a mole proportion of a 1,6-dibromohexane with an excess of at least 30 moles of an ammonium salt and an excess of at least 40 moles of ammonia followed by evaporation of excess ammonia after the formation of hexamethylenediamine-dihydrobromide in the reaction mixture, and

b. separation of the reaction product comprising a mixture of hexamethylenediamine-dihydrobromide and ammonium bromide by contacting the said-mixture with a solvent system comprising an organic solvent and from 1 mol percent to 50 mol percent of a modifier selected from the group consisting of ammonia, water and methanol, leaving the said ammonium bromide undissolved, removing the said solid ammonium bromide, and

c. subjecting the said solvent system to a precipitation treatment by removing the said modifier with the resultant precipitation of the hexamethylene-dihydrobromide, and

d. neutralizing the said hexamethylenediamine-dihydrobromide with a base to obtain the free hexamethylenediamine.

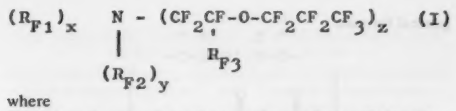
2. A process for separating hexamethylenediamine dihydrobromide from inorganic ammonium salts which comprises contacting a mixture thereof, with an organic solvent, the said organic solvent having present therein from 1 mol percent to 50 mol percent of a modifier selected from the group consisting of ammonia, water and methanol, and thereafter removing the solvent containing dissolved hexamethylenediamine dihydrobromide from the said insoluble inorganic ammonium salts.

3,882,182
TERTIARY PERFLUORO-AMINO ETHERS

Siegfried Benninger, Schwalbach, Taunus, and Thomas Martini, Neuenhain, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 9, 1973, Ser. No. 386,857
Claims priority, application Germany, Feb. 9, 1973, 2306438
Int. Cl. C07c *93/02*
U.S. Cl. 260—584 C **8 Claims**

1. A compound of the formula



where

R_{F1} is a linear or branched perfluoro-alkyl radical having from 1 to 10 carbon atoms;

R_{F2} is a perfluoro-alkyl radical having from 1 to 10 carbon atoms or the radical

R_{F3} is a CF_3 or F radical;

x, y and z each are integers; x an y each being 0, 1 or 2, z being 1,2 or 3, and $x + y + z$ being 3.

3,882,183
PROCESS FOR THE ALKYLATION OF AROMATIC HYDROCARBONS

Giuseppe Messina, Alghero; Loreno Lorenzoni, Porto Torres, and Natale Bertolini, Milan, all of Italy, assignors to Societa Italiana Resine, S.I.R. S.p.A., Milan, Italy

Filed Nov. 15, 1973, Ser. No. 416,137
Claims priority, application Italy, Nov. 30, 1972, 322/71
Int. Cl. C07c *3/56*
U.S. Cl. 260—671 R **6 Claims**

1. A process for the alkylation of aromatic hydrocarbons by reaction of an olefin with an aromatic hydrocarbon in the presence of a complex catalyst comprising a metal halide and aromatic hydrocarbons, in which the activity of the complex catalyst is maintained by addition of fresh metal halide, characterized in that the activity of the catalyst is measured by determination of the ratio of the dialkylated products to the trialkylated products in the complex catalyst or in the liquid alkylation product and fresh metal halide is added to the complex catalyst in such amounts as to maintain said ratio at predetermined values.

3,882,184
PROCESS FOR THE SEPARATION OF ACYCLIC AND MONOCYCLIC MONOTERPENES

Donald H. Rosback, Elmhurst, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 2, 1974, Ser. No. 466,368
Int. Cl. C01b *33/28;* **C07c** *7/12, 13/00;* **C09f** *3/02*
U.S. Cl. 260—675.5 **29 Claims**

1. A process for separating an acyclic monoterpene from a feed mixture comprising an acyclic monoterpene and a monocyclic monoterpene which process comprises contacting said mixture with a crystalline aluminosilicate adsorbent selected from the group consisting of type X structured and type Y structured zeolites containing at least one cation selected from the group consisting of lithium, sodium, potassium, rubidium, cesium and barium at the exchangeable cationic sites within said zeolite thereby selectively adsorbing, at adsorption conditions, said acyclic monoterpene isomer from said mixture and thereafter recovering the selectively adsorbed isomer.

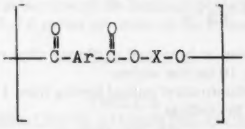
3,882,185
ACID-MODIFIED POLYTEREPHTHALIC ACID ESTERS

Eduard Radlmann, Dormagen; Eugen Velker, Dormagen-Hackenbroich; Francis Bentz, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed May 18, 1973, Ser. No. 361,466
Claims priority, application Germany, May 18, 1972, 2225255
Int. Cl. C08g *17/08*
U.S. Cl. 260—75 S **4 Claims**

1. A high molecular weight linear terephthalic acid copolyester which contains sulfonate groups, which copolyester consists essentially of recurrent structural elements of the

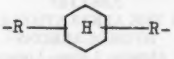
general formula



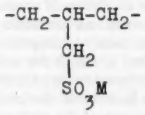
in which

Ar represents p-phenylene or p-phenylene with up to 10 mol % m-phenylene,

X consists of 99 – 70 mols-% of a straight or branched chain C_2 to C_{20} alkylene group, a cycloalkylene group or a group of the general formula



in which R represents a straight or branched chain C_1 to C_{10} alkylene group and 1 – 30 mols-% of a group which contains sulfonate groups, represented by the general formula



in which M represents a metal.

3,882,186

RETARDATION OF RUBBER VULCANIZATION

Maurice Edward Cain; Geoffrey Thomas Knight; Peter McHugh Lewis; Ian Richard Gelling, all of London, England, assignors to Natural Rubber Producers' Research Association, London, England

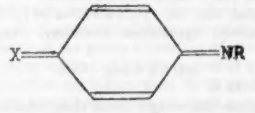
Filed Aug. 23, 1973, Ser. No. 390,740

Claims priority, application United Kingdom, Aug. 23, 1972, 39354/72

Int. Cl. C08c *11/40;* **C08d** *1/38*

U.S. Cl. 260—780 **7 Claims**

1. A method of inhibiting the premature vulcanization of a rubber vulcanizable by heating with a sulphur vulcanizing agent and a thiazole vulcanization accelerator, which method comprises incorporating into the rubber, in addition to the sulphur vulcanizing agent and the thiazole vulcanization accelerator, a cyclohexa-2,5-diene derivative having the formula



where X is O or NR′ and R and R′ may be the same or different and are inert alkyl, cycloalkyl or aryl groups.

3,882,187

RADIATION CURABLE EPOXY ESTER-SATURATED ALKYD COMPOSITIONS

Eiichiro Takiyama, Kamakura; Sadakazu Hokamura, Kamato, and Toshiaki Hanyuda, Yokohama, all of Japan, assignors to Showa High Polymer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 224,917, Feb. 9, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 417,760

Claims priority, application Japan, Feb. 10, 1971, 46-5254

Int. Cl. C08g *39/10, 45/14*

U.S. Cl. 260—835 **5 Claims**

1. An unsaturated epoxy-ester resinous composition curable under electron beam radiation to form a coating film with excellent dryness and adhesion to metals, which composition comprises: a reaction product of

a. one equivalent weight of an epoxy compound having at least two epoxy radicals in the molecule,

b. 0.5 equivalent weight of an unsaturated monocarboxylic acid, and

c. 0.5 equivalent weight of a saturated alkyd which has a terminal carboxyl radical in the molecule and is produced by heating one mole of a glycol with 1.33 to 2.0 moles of a saturated dicarboxylic acid,

said reaction product being produced under heating and in the presence of an esterification catalyst and with or without a polymerization inhibitor, solvent, polymerizable monomer selected from the group consisting of ethylacrylate, butylacrylate, methylmethacrylate, ethylmethacrylate, butylmethacrylate, isobutylmethacrylate, hydroxy-ethylmethacrylate, hydroxy-ethylacrylate, hydroxy-propylmethacrylate, acrylonitrile, vinyl acetate, styrene, vinyl toluene, ethylene glycol-diacrylate, ethylene glycol-dimethacrylate, trimethylol-propane-trimethacrylate, diethylene glycol-dimethacrylate, diethylene glycol-diacrylate and butanediol-dimethacrylate, or additional solvent.

3,882,188

COATING COMPOSITIONS AND PROCESS THEREFOR

Klaus Behmel, Graz, Austria, assignor to Vianova-Kunsthraz, A.G., Vienna, Austria

Filed Oct. 17, 1972, Ser. No. 298,388

Claims priority, application Austria, Oct. 29, 1971, 9369/71; Mar. 10, 1972, 1995/72; Mar. 22, 1972, 2430/72

Int. Cl. C08g *37/34, 17/14*

U.S. Cl. 260—850 **22 Claims**

1. Process for producing thermosetting coating compositions from saturated polyesters containing hydroxy groups and aminoplast resins, characterized in that

A) *n* mols of one or more compounds having two free or latent hydroxy groups are reacted with

B $n + 1$ mols of a dicarboxylic acid which will not form an anhydride, to form a linear polyester AB carrying terminal carboxy groups,

C. thereafter polyester AB is reacted at an elevated temperature, with elimination of reaction water until a low acid value is obtained with an amine alcohol of the general formula

$$HO - (CX_2)_n - NH_2$$

n being 2 or 3 and X is equal or different and standing for hydrogen, or an alkyl, aryl or hydroxy alkyl radical, at least one of said X being hydroxy alkyl, the amount of AB to amine being equal to $(e_s - e_p)\ M_A$ wherein M_A is the molecular weight of the amine alcohol; e_s equals the number of carboxy equivalents in the polyester; and e_p equals the number of hydroxy equivalents in the polyester, and not exceeding 2 mols amine alcohol per mol polyester AB, to provide a polyester containing terminal oxazoline groups, and

D. combining ABC containing terminal oxazoline groups with 10 – 60 percent by weight of an aminoplast resin.

3,882,189
POLYESTER RESINS PREPARED FROM ORGANIC POLYISOCYANATES AND BLENDS WITH OTHER RESINS OR MONOMERS

Stephen F. Hudak, Minneapolis, Minn., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 145,502, May 20, 1971, Pat. No. 3,759,873, which is a continuation of Ser. No. 716,349, March 27, 1968, abandoned. This application Apr. 19, 1973, Ser. No. 352,482

Int. Cl. C08g *37/34, 39/10*

U.S. Cl. 260—850 **4 Claims**

1. A water reducible resinous coating composition comprising from 95 to 50 parts by weight of (1) a water-soluble lower alkyl amine salt of a polyurethane modified polyester consisting essentially of the reaction product of:

a. a mixture of saturated polyhydroxy alcohols of which from about 5 to 25 percent by weight contains at least three functional groups and wherein one of said three functional groups is a carboxyl group,

b. at least one saturated polycarboxylic acid, and;

c. an organic polyisocyanate compound; said reaction product being the result of preliminary reaction between (a) and (b) to form a saturated polyester intermediate which is subsequently reacted with (c) to form the modified polyester; the proportion of the reactants (a), (b) and (c) being selected so that the OH/(COOH+NCO) ratio is from 1 to 2.0 and the COOH/NCO ratio is greater than 1 and up to about 30 and correspondingly from 5 to 50 parts of an aminoplast resin.

3,882,190
ANTISTATIC POLYAMIDE FIBER

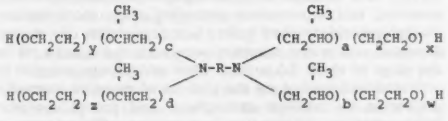
Rodney Lee Wells, Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,873. The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

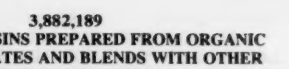
Int. Cl. C08g *41/04*

U.S. Cl. 260—857 PG **10 Claims**

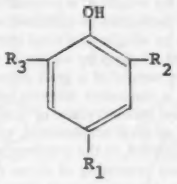
1. In a process for the formation of an antistatic polyamide fiber from a fiber-forming polyamide polymer containing about 1 to 12 percent by weight of an antistatic compound which is a chain-extended reaction product of a tetrol compound represented by the formula:



where *a*, *b*, *c*, *d*, *w*, *x*, *y* and *z* are each a whole number and R is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000, and at least one compound selected from the group consisting of compounds which yield the following divalent radical:



where R' is a difunctional radical from a hydrocarbon containing 1 to 30 carbon atoms, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filaments, the improvement comprising dissolving in the extrudate prior to extrusion at least 0.5 percent by weight, based on the weight of the antistatic compound, of a phenol compound of the formula:



where R_1 is hydrogen or an alkyl radical containing 1 to 12 carbon atoms, R_2 is an alkyl radical containing 4 to 18 carbon atoms, and R_3 is an alkyl radical containing 4 to 18 atoms.

3,882,191
BLEND OF THERMOPLASTIC POLYURETHANE ELASTOMER, POLYVINYL CHLORIDE RESIN AND CHLORINATED POLYETHYLENE

Julius A. Balatoni, Waterloo; Som N. Khanna, Guelph, and Wayne S. Mills, Kitchener, all of Canada, assignors to Uniroyal Ltd., Montreal, Canada

Filed Mar. 29, 1973, Ser. No. 345,924

Int. Cl. C08G *41/04*

U.S. Cl. 260—859 PV **2 Claims**

1. A method of making a shaped article comprising the steps of blending

A. a high molecular weight thermoplastic polyurethane elastomer devoid of ethylenic unsaturation and free —NCO groups which is a reaction product of a polymeric polyol, an organic polyisocyanate and a low molecular weight bifunctional material having two reactive hydrogens,

B. polyvinyl chloride resin, and

C. an elastomeric chlorinated polyethylene having a glass transition temperature of −30°C to −20°C. and a chlorine content of 25–50% by weight,

the amount of (A) being 40–60%, the amount of (B) being 15–25%, and the amount of (C) being 15–30%, based on the weight of the three polymers, the resulting blend being repeatedly reprocessable and being devoid of curing agent, and forming the resulting blend into a shaped article without cure.

3,882,192

POLYCARBONATE-POLYVINYL CHLORIDE MOULDING COMPOSITIONS

Salah Elabd Elghani; Winfried Fischer, both of Cologne, Germany; Michael Koehler, Wien, Austria, Johannes Lindner, Hamburg, and Richard Prinz, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 28, 1974, Ser. No. 437,154

Claims priority, application Germany, Feb. 1, 1973, 2304894

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 3 Claims

1. A moulding composition consisting essentially of

a. 5 to 95 parts by weight of a polycarbonate of a dihydric phenol and a derivative of carbonic acid,

b. 5 to 95 parts by weight of a vinyl chloride polymer containing at least 80 parts by weight of vinyl chloride and

5 to 95 parts by weight of a graft copolymer obtained by polymerizing a monomer mixture of styrene, an alkyl styrene, methyl methacrylate, or a mixture thereof with acrulonitrile, an alkyl acrylonitrile, methyl methacrylate, or a mixture thereof, in the presence of a rubber selected from the group consisting of diene polymers and ethylene-propylene-non-conjugated diene terpolymers, a copolymer of styrene and maleic anhydride or a coploymer of ethylene and vinyl acetate containing 1 to 80 percent by weight of vinyl acetate.

3,882,193

FLUORINE-CONTAINING BLOCK COPOLYMERS

David E. Rice, Woodbury, and Robert L. Hansen, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 168,373, Aug. 2, 1971, Pat. No. 3,810,875, which is a continuation-in-part of Ser. No. 70,541, Sept. 8, 1970, abandoned. This application Sept. 17, 1973, Ser. No. 397,841. The portion of the term of this patent subsequent to May 14, 1974, has been disclaimed.

Int. Cl. C08f *29/16*

U.S. Cl. 260—874 13 Claims

1. A block copolymer comprising at least one block derived from at least one free radical polymerizable terminally ethylenically unsaturated compound and at least one block comprising poly(perfluoroalkylene oxide) having a plurality of $-CF_2O-$ and $-C_2F_4O-$ and, optionally, $-C_3F_6O-$ randomly repeating units, said copolymer having at least 1 glass transition temperature below −78°C.

3,882,194

COGRAFTED COPOLYMERS OF A POLYOLEFIN, AN ACID OR ACID ANHYDRIDE AND AN ESTER MONOMER

Lawrence J. Krebaum, Palatine; William C. L. Wu, Arlington Heights, and John Machonis, Jr., Schaumburg, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Jan. 26, 1973, Ser. No. 327,065

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R 15 Claims

1. A cograft copolymer of about 50–99.9 weight percent of a polyolefin member of the group consisting of unconjugated and deactivated conjugated polyolefins, about 0.05–25 weight percent of at least one ethylenically unsaturated ester and about 0.05–25 weight percent of at least one member of the group consisting of polymerizable acyclic, cyclic and polycyclic ethylenically unsaturated acids and acid anhydrides.

3,882,195

PRE-EMULSIFICATION-DELAYED INITIATION SUSPENSION PEARL POLYMERIZATION PROCESS

Wiley E. Daniels, Easton; Dewey G. Holland, Chadds Ford, and Gerald J. Mantell, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 16, 1973, Ser. No. 360,835

Int. Cl. C08f *15/00*, *19/00*

U.S. Cl. 260—878 R 17 Claims

1. A process for preparing vinyl chloride based polymers selected from the group consisting of vinyl chloride homopolymers and copolymers containing vinyl chloride as the major constituent by suspension polymerization, which comprises:

a. pre-emulsifying a vinyl chloride based monomer(s) to form a stable dispersion of the monomer in an aqueous mixture in the absence of a polymerization initiator at temperatures ranging from about 30° to about 75°C with agitation, said aqueous mixture comprising a polyvalent metal ions selected from the group consisting of zirconium, magnesium, calcium, zinc, strontium, aluminum, lead, antimony, tin, barium and cadmium, in an amount in the range from about 0.01 to about 0.30 parts of said polyvalent metal ion per hundred parts monomer(s); a surface active agent in an amount in the range from about 0.01 to about 0.30 parts per hundred parts monomer(s); and a polymer seed selected from the group consisting of homopolymers of styrene, vinyl acetate and methacrylate, copolymers of vinyl acetate-ethylene, vinyl chloride-2-ethyl hexyl acrylate and vinyl chloride-vinyl isobutyl ether and carboxylated terpolymers of vinyl chloride-2-ethyl hexyl acrylate and the similar polymers which are soluble in the monomer(s) and are capable of stabilizing the emulsion, in an amount in the range from about 0.2 to about 2.0 parts of said polymer seed per hundred parts monomer(s),

b. initiating the suspension polymerization of the stabilized, monomer-containing emulsion to form the polymer in the presence of a free-radical initiator in an amount in the range from about 0.05 to about 0.5 parts of said initiator per hundred parts monomer(s), and

c. recovering the polymer product by filtration.

3,882,196

ODOR-FREE THERMOFORMED HEAT-DEGRADED POLYVINYL ALCOHOL

David E. Hanke, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 292,543, Sept. 27, 1972. This application Feb. 21, 1974, Ser. No. 444,482

Int. Cl. C08f *29/26*, *29/30*

U.S. Cl. 260—895 4 Claims

1. An improvement in the structure of thermoformed cold-water-soluble polyvinyl alcohol which has a percent hydrolysis in the range of 74 to about 98 and which structure has been heat-degraded by such thermoforming to the extent that some free acetic acid is produced in the thermoformed polyvinyl alcohol and is distributed throughout said thermoformed structure, said improvement consisting of the incorporation throughout said structure before heat degradation of a proton acceptor, said proton acceptor being such that it has a pH in the range of about 7.5 to 12.0 when said proton acceptor is activated and ionized by the pick-up of moisture normally present in the ambient atmosphere, said proton acceptor being present in said structure in an amount sufficient to react with and to neutralize any of said acetic acid which is also ionized when said structure is exposed to the moisture normally present in the ambient atmosphere, said proton acceptor being present in an amount of up to about 5 parts by weight of said polyvinyl alcohol structure thereby providing a heat-degraded polyvinyl alcohol structure which remains substantially free of the odor of said acetic acid.

3,882,197
ALPHA-OLEFIN COPOLYMER BLENDS

Andrea Fritz, and Chi-Kai Shih, both of Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed June 21, 1973, Ser. No. 372,050
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 A **6 Claims**

1. An intimate polymer blend comprising, by weight of the blend,

a. about from 5–90 percent of a thermoplastic, elastomeric copolymer of propylene and at least one alpha-olefin having from 6–20 carbon atoms, the copolymer having stereoregular crystalline sequences and amorphous sequences, about from 10–50 wt. percent of the copolymer being derived from the alpha-olefin, the remainder being derived from propylene, the copolymer having a melt index of about from 0.01–200 at 190°C and a crystallinity number of about from 40–70;

b. about from 5–90 percent of polymer having at least one melting transition above 155°C and which consists essentially of substantially stereoregular polypropylene of the same type of stereoregularity as copolymer (a); and

c. about from 5–80 percent of an uncured ethylene hydrocarbon copolymer rubber which is a copolymer of ethylene, at least one alpha-olefin of the formula $RCH_2—CH=CH_2$ wherein R is hydrogen or $C_1—C_{15}$ alkyl, and optionally at least one non-conjugated diene.

3,882,198
POLYVINYL HALIDE RESIN COMPOSITIONS HAVING IMPROVED PROCESSABILITY CONTAINING A METHYL METHACRYLATE/ALKYLACRYLATE COPOLYMER

Robert S. Miller, Bridgewater, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 271,451, July 13, 1972. This application May 20, 1974, Ser. No. 471,469
Int. Cl. C08f *29/24*
U.S. Cl. 260—899 **10 Claims**

1. A resinous composition comprising a polyvinyl halide resin and from 1 to 20 parts by weight per 100 parts by weight of the polyvinyl halide resin of a methacrylate copolymer that is the product formed by the process that comprises the steps of

a. forming an aqueous emulsion that contains

i. a monomer mixture consisting of 80 to 99 mole percent of methyl methacrylate and 1 to 20 mole percent of at least one alkyl acrylate wherein the alkyl group has 1 to 10 carbon atoms,

ii. a water-soluble, free-radical catalyst selected from the group consisting of hydrogen peroxide, ammonium persulfate, and alkali metal persulfates,

iii. an emulsifying agent, and

iv. An alkyl mercaptan having 4 to 14 carbon atoms;

b. maintaining said aqueous emulsion at a temperature in the range of 50°to 70°C. until about 40 to 60 mole percent of the monomer mixture has polymerized;

c. raising the temperature of the aqueous emulsion by at least 10°C. to a temperature in the range of 70°to 100°C. over a period of 10 to 40 minutes;

d. maintaining the aqueous emulsion at a temperature in the range of 70°to 100°C. until the polymerization of the monomer mixture is substantially complete and a latex emulsion is formed; and

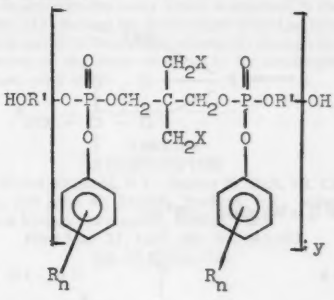
e. recovering the methyl methacrylate-alkyl acrylate copolymer from the latex emulsion.

3,882,199
POLYMERIC HALOGENATED ORGANOPHOSPHORUS DIOLS

Wadim Batorewicz, New Haven, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,703
Int. Cl. C07f *9/18*
U.S. Cl. 260—928 **8 Claims**

1. A polymeric halogenated organophosphorus ester diol having the structure



wherein R may be:

a. hydrogen, chlorine, or bromine;

b. an alkyl, haloalkyl, or alkoxy radical having from 1 to 6 carbon atoms;

wherein *n* may vary from 1 to 3;

wherein R′ may be:

c. a branched or linear alkylene, alkenylene, alkynylene or alkoxyalkylene radical containing from 2 to 10 carbon atoms; optionally containing bromine or chlorine substituents,

wherein X may be chlorine or bromine; and

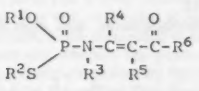
wherein y has a value of from 1 to 7.

3,882,200
PHOSPHOROAMIDOTHIOATES

Francis J. Freenor, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 6, 1973, Ser. No. 394,872
Int. Cl. A01n *9/36*; **C07f** *9/24*
U.S. Cl. 260—946 **10 Claims**

1. A compound of the formula



wherein R^1 and R^2 individually are alkyl of 1 to 6 carbon atoms or alkenyl of 3 to 6 carbon atoms; R^4 is hydrogen, alkyl of 1 to 6 carbon atoms or haloalkyl of 1 to 6 carbons atoms and 1 to 3 fluorine, chlorine or bromine; R^3 and R^5 individually are hydrogen or alkyl of 1 to 6 carbon atoms; R^6 is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms and 1 to 3 fluorine, chlorine or bromine, phenyl or phenyl substituted with 1 to 2 alkyl of 1 to 4 carbon atoms, fluorine, chlorine or bromine, with the proviso that two alkyl R^4 and R^6 groups may be joined to form a 5 - or 6-membered carbocyclic ring.

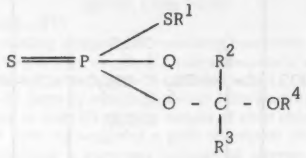
3,882,201

THIOPHOSPHORIC ACID TRIESTERS

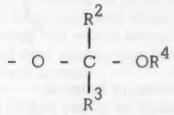
Erich Ruf, Essen, Germany, assignor to The Goldschmidt AG

Division of Ser. No. 160,144, July 6, 1971, Pat. No. 3,770,853.
This application Mar. 21, 1973, Ser. No. 343,372
Claims priority, application Germany, July 9, 1970, 2033987
Int. Cl. C07f 9/16
U.S. Cl. 260—950 **1 Claim**

1. A compound having the formula



wherein Q is the group —SR^1 or



in which

R^1 and R^4 are selected from the group consisting of alkyl and chloroalkyl groups having about 1 to 12 carbon atoms, benzyl, phenyl, and chlorophenyl, and

R^2 and R^3 are selected from the group consisting of hydrogen, alkyl and chloroalkyl groups having about 1 to 12 carbon atoms, benzyl, phenyl, and chlorophenyl.

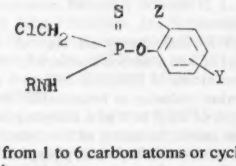
3,882,202

AMIDOTHIONOPHOSPHORIC ACID ESTERS

Masahiro Aya; Shigeo Kishino; Nobuo Fukazawa, and Toyohiko Kume, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 27, 1972, Ser. No. 319,092
Claims priority, application Japan, Dec. 27, 1971, 46-105444
Int. Cl. C07f 9/40
U.S. Cl. 260—951 **15 Claims**

1. Amidothionophosphonic acid ester compound of the formula:



in which

R is alkyl of from 1 to 6 carbon atoms or cycloalkyl of from 5 to 6 carbon atoms;

Y is hydrogen, halogen or alkyl or alkoxy of from 1 to 6 carbon atoms; and

Z is nitro.

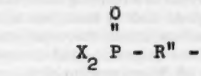
3,882,203

HYDROCARBON-PEROXY HYDROCARBON PHOSPHONATES

Lothar G. Dulog, Latem, and Willy P. Broeckx, Reet, both of Belgium, assignors to S.A. Texaco Belgium N.V., Brussels, Belgium

Filed Sept. 25, 1972, Ser. No. 291,868
Int. Cl. C07f 9/40; C08f 3/74
U.S. Cl. 260—961 **4 Claims**

1.



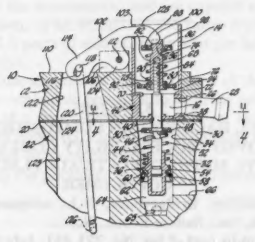
wherein R is a hydrocarbon containing less than about 18 carbon atoms and R may be inertly substituted, R'' is divalent hydrocarbon containing 2–10 carbon atoms and R' may be inertly substituted and X is —OR or —NR_2.

3,882,204

MECHANICALLY ACTUATED VENT SWITCH

James C. St. Amand, Spencerport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1974, Ser. No. 440,455
Int. Cl. F02m 5/08
U.S. Cl. 261—34 A **2 Claims**



2. In a carburetor having a fuel bowl housing defining a primary fuel chamber closed by an air horn housing and wherein an accelerator pump assembly is located within the primary fuel chamber for providing fuel enrichment under acceleration conditions, the improvement comprising: an air horn housing having a chamber with an inlet passage in communication with the primary fuel bowl and an outlet passage adapted to be connected to a charcoal cannister for collecting vapors from the primary fuel chamber, a valve seat formed in said air horn chamber between said inlet passages and said outlet passages, a vent valve located in overlying relationshhip with said valve seat movable with respect to said valve seat to open and close communication between the inlet passage to said chamber and the outlet passage therefrom, said movable vent valve having a central opening therethrough, a shaft directed through said opening, coacting means on said shaft and said air horn housing for preventing relative rotation therebetween, said shaft having one end thereof adapted to be connected to an accelerator plunger assembly and including a threaded extension on the other end thereof located centrally of said annular valve seat and extending therefrom into said air horn housing chamber, a stem adaptor including a flanged opened end thereon and an internally threaded bore threadably received on said extension for axially positioning said stem adaptor with respect to said threaded extension, said vent valve having a central opening therethrough through which said stem adaptor extends with said flanged end engaging said vent valve around the central opening therein for supporting said vent valve for movement away from said

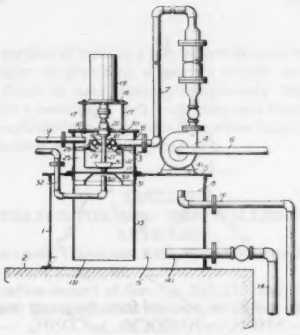
annular valve seat, said stem adaptor including a grooved upper end thereon having a spring retainer slidably supported therein, spring means connected between said retainer and said vent valve for holding said vent valve against said flange, actuator means for reciprocating said stem adaptor and said shaft with respect to said air horn housing upon throttle movement, said actuator means including a first operative position wherein said stem adaptor and shaft are moved inwardly of said chamber to position said vent valve in sealed engagement with said annular valve seat to prevent vapor transfer from the primary fuel bowl to the cannister when the throttle is open said actuator means having a second position wherein said stem adaptor and spring retainer are moved with respect to said closed vent value for operating said plunger assembly when said vent valve is closed, said actuator means having a third operative position wherein said shaft and said stem adaptor are moved outwardly of said air horn housing to locate said vent valve in spaced relationship with said valve seat to permit transfer of vapors from the primary fuel chamber to the cannister.

3,882,205

APPARATUS FOR DISSOLVING LARGE QUANTITIES OF OXYGEN IN WATER

Toyohiko Aoki, Tokyo, Japan, assignor to Naigai Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1974, Ser. No. 461,001
Int. Cl. B01f *3/04*
U.S. Cl. 261—37 **3 Claims**



1. An oxygen-dissolving apparatus comprising in combination:

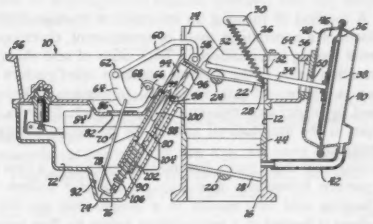
a. an air-tight cistern (**1**);
b. a tank (**3**) on said cistern;
c. an elongated inner vessel (**13**) in said cistern (**1**) under said tank (**3**) with a perforated partition (**11**) between said tank (**3**) and said inner vessel (**13**), said inner vessel being concentric with said tank (**3**) within the cistern (**1**), said inner vessel having a lower opening (**131**);
d. a rotary shaft (**21**) disposed perpendicularly in said tank (**3**) with a perforated drum (**22**) around said shaft at an upper part of which an opening (**29**) is formed and at a lower part of which a water receiving dish (**26**) is disposed;
e. a conduit (**9**) leading into said tank (**3**) for supplying oxygen into said drum (**22**), a water-supplying pipe (**8**) leading into said tank and a pump (**4**) for supplying water into said tank;
f. a circular part (**81**) above said opening (**29**) at the end of said pipe (**8**) around which circular part (**81**) a plurality of spouts (**82**) are disposed for discharging water towards said dish (**26**);
g. a feeding conduit (**14**) at a lower part of said cistern (**1**) with an end (**141**) thereof a little above said lower opening (**131**) and a conduit (**16**) for controlling the discharge of water supplied to said dish (**26**) from the spouts (**82**), wherein water is finely divided by the dish rotated by said rotary shaft at high speed so that fine drops are formed while oxygen is released into a circular space (**25**) between an outer circumference of said drum (**22**) and an inner circumference of the tank (**3**) through perforations (**23**) (**24**) due to the centrifugal force of the drum (**22**) being rotated at high speed so that water and oxygen mixing takes place continuously dissolving a large volume of oxygen into the water which is received in the inner vessel (**13**) through the perforations of said partition (**11**) and is stored in the air tight cistern (**1**) through the lower opening of the inner vessel (**13**) for discharging into oxygen-poor water.

3,882,206

CARBURETOR

John A. Gural, Pittsford, N.Y.; Stanley H. Mick, Mt. Clemens, Mich., and John W. Moulds, Penfield, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1973, Ser. No. 343,553
Int. Cl. F02m *7/18*
U.S. Cl. 261—39 B **8 Claims**



1. A carburetor comprising a mixture conduit having an air inlet and a mixture outlet, a throttle disposed in said mixture outlet and controlling flow therethrough, an air valve rotatably disposed in said air inlet, means controlling said air valve whereby its rotative position is a measure of the rate of air flow through said air inlet, a fuel bowl, a fuel passage receiving fuel from said fuel bowl and discharging fuel into said mixture conduit, a metering orifice disposed in said fuel passage, a metering rod associated with said metering orifice and controlling the area thereof to control the rate of fuel flow from said fuel bowl through said passage and said orifice to said mixture conduit, a pivot pin, a lever pivoted on said pin, said lever having a first lever arm connected to said metering rod and a second lever arm, a link connected to said air valve and to said second lever arm whereby the positions of said lever and said metering rod are controlled by the rotative position of said air valve and the rate of fuel flow through said passage to said mixture conduit is proportioned to the rate of air flow through said air inlet, said second lever arm having a slot formed therein and receiving said link, and operating condition responsive means controlling the position of said link in said slot whereby the length of said second lever arm may be varied to adjust the proportion of fuel flow to air flow, said operating condition responsive means including an aneroid responsive to inlet air pressure and operative to increase the length of said second lever arm upon a decrease in inlet air pressure whereby a proper proportion of fuel flow to air flow is maintained upon a decrease in inlet air pressure.

3,882,207

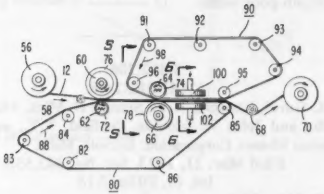
PROCESS OF PRODUCING DOUBLE-SIDED HOLOGRAPHIC REPLICAS

William James Hannan, Palm Beach Gardens, Fla., and Joseph Ralph Frattarola, Hightstown, N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 296,861, Oct. 12, 1972, Pat. No. 3,790,245. This application Oct. 18, 1973, Ser. No. 407,545

Int. Cl. B29c *17/00;* B29d *11/00*

U.S. Cl. 264—1 4 Claims



1. A method of forming an information storage replica in the form of a continuous sheet of transparent, thermoplastic material having information on both sides of said sheet, said information being in the form of a surface relief pattern comprising a tilted off-axis recorded transmission hologram formed by object and reference beams which define a plane oblique to the longitudinal axis of the hologram comprising the steps of:

passing said sheet and a first master containing a first relief pattern between a first pair of calender rollers while heating said first master to a temperature so that said sheet is heated to a temperature below its flow temperature, but one which causes said sheet to adhere firmly to said first master, to impress said first pattern into one side of said sheet,

passing said sheet adhered to said first master and a second master containing a second relief pattern between a second pair of calender rollers while heating said second master to a temperature below the flow temperature of said sheet to press said second pattern into said sheet on the opposite side from said first pattern,

cooling said first and second masters below a temperature at which said sheet adheres to said masters, and

separating said sheet from said first and second masters.

3,882,208

METHOD FOR PRODUCTION OF SPHERICAL PARTICLES OF A SOLID MATERIAL

William Geresy, Jr., Bedford Hills, N.Y., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 30, 1970, Ser. No. 76,898

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 C 9 Claims

1. A process for making spherical particles of a solid explosive or propellant material which comprises subjecting said solid explosive or propellant material to a temperature above its melting point in a liquid medium,

passing the molten solid thereby formed through a progression of successively lower temperature zones of the same liquid mediums and collecting the solidified spherical particles.

3,882,209

METHOD FOR EXTRUSION COATING ELECTRIC WIRES WITH A FOAMED POLYOLEFIN RESIN INVOLVING REDUCED DIE-PLATEOUT

Koji Yanagisawa; Hirokazu Kobayashi, and Yukio Tayama, all of Chiba-ken, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

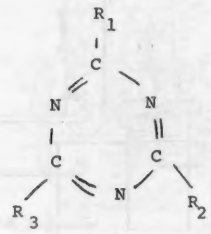
Filed July 30, 1973, Ser. No. 383,719

Claims priority, application Japan, Aug. 3, 1972, 47-77810; Aug. 3, 1972, 47-77811; Aug. 3, 1972, 47-77812; May 5, 1973, 48-62516

Int. Cl. B29d *27/09*

U.S. Cl. 264—45.9 16 Claims

1. A method for manufacturing electric wires insulated with a foamed polyolefin resin by continuous, stable extrusion wherein a foamable polyolefin resin composition is prepared by mixing a polyolefin resin with a foaming agent comprising azodicarbonamide and between about 10 and 150 percent by weight of at least one material having a solubility parameter of at least 12.0 based on the amount of said azodicarbonamide and extruding it on an electric conductor under conditions in which said azodicarbonamide decomposes, said material having said solubility parameter being selected from the group consisting of polyhydric alcohols having less than eight carbon atoms, ethanol amines having less than six carbon atoms, alkanols having less than three carbon atoms, dimethyl sulfoxide, carboxymethyl cellulose, methyl cellulose, lignin, lignin sulfonic acid, lactones, alkyl acetamides, alkylformamides, phenols, ethylene carbonate, thiourea, succinimide, and compounds containing a 1,3,5-triazine ring expressed by the general formula



where R_1, R_2 and R_3 are selected from the group consisting of — NH_2, —NHOH, —$NHCOCH_3$, —$CONH_2$, —$CSNH_2$, —$NHCONH_2$, $NHCH_3$,

—$NHSO_3H$, —SO_2NH_2 and NHCHO.

3,882,210

INJECTION OF A CERAMIC INTO A MOULD

Ian Alexander Crossley, Little Staughton; Geoffrey Eric Kirk, Gotham; Norman Howell Anthony, Spondon, and Derek Robert Bamber, Castle Donington, all of England, assignors to Rolls-Royce Limited, London and The University of Technology, Leicestershire, both of England

Filed Nov. 17, 1972, Ser. No. 307,525

Claims priority, application United Kingdom, Nov. 19, 1971, 53786/71

Int. Cl. B29c *25/00*

U.S. Cl. 264—63 5 Claims

1. A method of producing an article from a mixture of alpha silicon carbide, graphite and a binder thereof, including the steps of charging a chamber with the mix, attaching the chamber to a mould member, heating the assembly, forcing the mix

through a nozzle in the chamber so as to firstly compact the mix and secondly inject it into said mould member, increasing said force so as to further compact the mix whilst in the mould member, then removing said force, separating the chamber from the mould member and then the mix from the mould member.

3,882,211

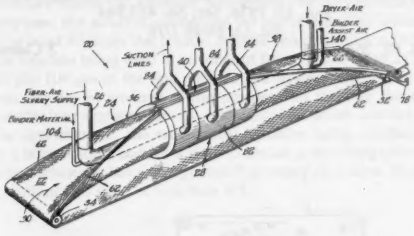
METHOD FOR THE HIGH SPEED PRODUCTION OF NON-WOVEN FABRICS

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 51,967, July 2, 1970. This application July 20, 1973, Ser. No. 380,963

Int. Cl. B29d *23/03*; **D04h** *1/00*

U.S. Cl. 264—91 **9 Claims**



1. The method of making a non-woven fibrous web comprising the steps of: providing a gaseous stream; incorporating discrete fibers in said stream; continuously directing said stream into a centrifugal flow; collecting said fibers from said flow as a substantially longitudinally endless tubular web; and de-tubularizing and flattening said web.

3,882,212

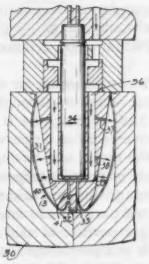
PROCESS FOR FORMING THIN WALLED PLASTIC ARTICLES

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 214,275, Dec. 30, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 400,104

Int. Cl. B29c *17/07*

U.S. Cl. 264—94 **4 Claims**



1. The method for producing elongated relatively thin walled hollow thermoplastic articles with controlled wall thicknesses in an injection-blow molding arrangement, wherein the male injection mold part is retained at one end against axial movement within and relative to the female injection mold part to define a mold cavity and wherein the other end of said male injection mold part is capable of being deflected in a radial direction and wherein the injection molded preform is susceptible to shifting on said male mold part in blowing said article in a female blow mold having the shape of said article comprising the steps of:

directing a stream of a molten thermoplastic material into the injection mold cavity through the female injection mold part toward said other end of said male injection mold part and along the axis from which the male injection mold part is deflectable,

thereafter directing said stream consecutively through restricted circumferentially continuous concentric annular areas encircling the entrance of said stream of molten thermoplastic material into said cavity and maintaining said axially fixed relation of said male injection mold part while continuing the foregoing flow of molten thermoplastic material through said concentric annular areas to fill said cavity to form the injection molded preform with circumferentially continuous concentric annular portions at said other end,

moving said male injection mold part with said preform thereon into a female blow mold with said other end of said male injection mold part spaced from and sufficiently adjacent to one interior surface of said female blow mold to mechanically lock said circumferentially continous concentric annular portion of said preform on said male injection mold part during initial blowing,

applying blowing air through the sides and said other end of said male mold part to blow the sides of said preform against the interior surface of said female blow mold during initial blowing and to thereafter blow said other end of said injection molded preform into the shape of said article

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3,882,213

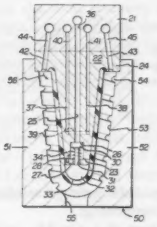
METHOD OF MAKING BLOWN PLASTIC ARTICLES

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 225,448, Feb. 11, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 443,092

Int. Cl. B29c *17/07*, *25/00*

U.S. Cl. 264—97 **5 Claims**



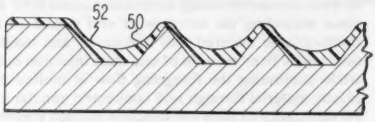
1. In a method of making a blown thermoplastic article, the steps of forming a parison of thermoplastic material, enclosing said parison in an individual heat exchange chamber having opposed openable and closeable sections, the sections having interior walls spaced substantially uniformly from the exterior of said parison, flowing a fluid heat transfer medium through the space between said parison and said interior section walls, terminating the flow of heat transfer medium when the average wall temperature of the parison is conducive to orientation during subsequent blowing of the parison, opening said opposed heat chamber sections, transferring the parison at said temperature to a blow mold, and blowing said parison at said orientation temperature.

3,882,214

TRAPEZOIDAL SMOOTH GROOVES FOR VIDEO DISC

Richard William Nosker, Princeton, and Leonard Pincus Fox, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,235
Int. Cl. B29d *17/00*
U.S. Cl. 264—106 **6 Claims**



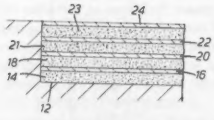
1. A method of forming a grooved disc for recording information therein comprising:
   forming a spiral groove to a trapezoidal cross-sectional shape in a disc having a relatively flat surface;
   filling said groove with viscous fluid material; and
   rotating said disc at a speed commensurate with viscosity of said fluid material to drive off a portion of said fluid material from said disc, leaving a residue of said fluid material coating the groove region of said disc and causing said fluid material to assume, when solidified, a regularly curved cross-sectional shape including inflection points on each wall of said groove located closer to the peaks than to the valley of said groove.

3,882,215

METHODS OF MAKING BUILDING AND LIKE COMPONENTS

Edward Dyke, Sheffield, and George Harold Farringdon, Wrenthorpe near Wakefield, both of England, assignors to FPA Fypol Limited, Sheffield, England

Continuation-in-part of Ser. No. 45,050, June 10, 1970, abandoned. This application June 23, 1972, Ser. No. 268,217
Int. Cl. D04h *1/16*
U.S. Cl. 264—113 **8 Claims**



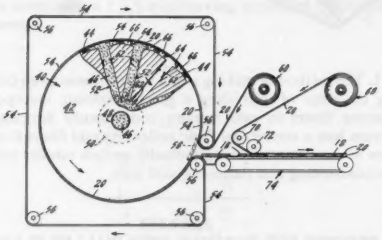
1. A method of manufacturing a reinforced polyester resin-filled component, comprising:
   a. forming a mixture of a curable liquid polyester resin, a monomer of a thermoplastic synthetic resin, a catalyst for said polymer, and an inert particulate filler material, said filler particles being capable of settling in said liquid resin as a lower layer containing the major part of said filler particles and an upper layer containing a minor part of said filler particles,
   b. pouring a portion of said mixture into a mold for said component,
   c. allowing said filler particles to settle into said lower and upper layers,
   d. placing a first reinforcing stratum of glass fiber on said resin upper layer in which said stratum is permeable, is impregnated therewith, and is allowed to sink and rest upon said filler lower layer to which said stratum is impervious,
   e. pouring a second portion of said mixture as in step (a) into said mold over said first reinforcing stratum,
   f. allowing said filler particles in the second portion of said mixture to settle upon and without displacing said first-placed stratum to form upper and lower layers as in step (c),
   g. placing on said second portion upper layer a second reinforcing stratum of said glass fiber which sinks and rests upon said second portion lower layer of filler particles, and
   h. curing all portions of said polyester resin to produce a unified component thereof.

3,882,216

DISPOSABLE DIAPER

John T. Delanty, and William F. Hanson, both of Neenah, Wis., assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 387,155, Aug. 9, 1973. This application Jan. 15, 1974, Ser. No. 433,504
Int. Cl. D04h *1/16*
U.S. Cl. 264—113 **3 Claims**



1. A method for forming an absorbent cellulose fluff fiber pad of generally hourglass outline suitable for incorporation in a disposable diaper comprising:
   suspending individual wood cellulose fibers in a stream of air,
   directing said fiber-containing air stream radially outward from the center of a drum through a chute-like structure, the outer end of which chute is substantially hourglass shaped and covered by an air pervious screen forming the side wall of the drum, and having an air pervious fiber-collecting web material interposed between said hourglass-shaped chute end and said screen,
   deflecting selected portions of said fiber-bearing air stream so that a larger portion of said fibers impinge on said collecting web in a preselected, centrally located section within the area of the collecting web and screen covering the hourglass-shaped chute end,
   collecting said fibers on said collecting web while allowing the air stream to pass through said web and screen, whereby there is formed on said collecting web an hourglass-shaped fiber pad having substantially greater fiber concentration in said preselected centrally located section and,
   removing said collecting web and the collected pad of fibers from said screen.

3,882,217

METHOD FOR THE PRODUCTION OF FREE-FLOWING POLYTETRAFLUOROETHYLENE MOLDING POWDERS

John Banham, Stevenage, and Howard Edmund Browning, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 205,656, Dec. 7, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,460
Claims priority, application United Kingdom, Dec. 11, 1970, 59005/70; July 26, 1971, 34952/71
Int. Cl. B01j 2/12
U.S. Cl. 264—117 11 Claims

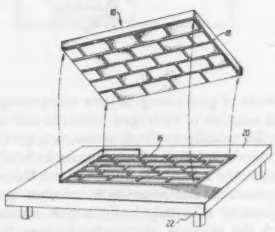
1. A process for the preparation of a free flowing granular moulding powder containing polytetrafluoroethylene which comprises the steps of wetting a fine particle size granular polytetrafluoroethylene powder wherein the particles have an air sedimentation size of less than 100 μm with an aqueous solution of a non-ionic surfactant which volatilises at a temperature below the sintering temperature of polytetrafluoroethylene, the solution containing the surfactant in an amount of at least 40 times the critical micelle concentration at 20°C, the solution being used in an amount from $21.5/\alpha$ ml to $215/\alpha$ ml per 100 gm of the fine particle size powder where α is the true density in gm/cm^3 of the powder and forming the wet powder into agglomerates by mechanical agitation, and drying the agglomerates, the mechanical agitation being conducted at a temperature and for a time to obtain a moulding powder which when dry has a compacted flow rating of at least 16 and a compaction ratio of less than 4.3.

3,882,218

BRICK TEXTURED BUILDING PANELS AND THEIR METHOD OF MANUFACTURE AND INSTALLATION

Charles G. Bixel, Jr., 395 Gardiner Dr., Fort Walton Beach, Fla. 32548

Filed July 11, 1973, Ser. No. 378,317
Int. Cl. B29c 3/00, 17/14; B29d 27/00
U.S. Cl. 264—157 3 Claims



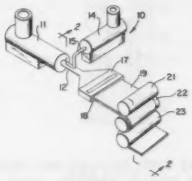
1. A method of manufacturing a brick-textured foamed thermoplastic building panel comprising the steps of severing a base panel from a rigid block of a foamed thermoplastic material having a density in the order of 2.5 lb./cu. ft., and simultaneously fusing the edges by means of a heated element whereby the edges of the panel exhibit the texture of masonry, cement or brick depending upon the temperature of the heated element and the speed by which the heated element is passed through the block, and forming a brick and mortar array on one surface portion of said panel by positioning the panel above a lattice-type rectangular array of heating elements and pressing the panel downwardly upon said elements to such an extent that the elements soften the material of the panel and form therein grooves which simulate mortar while the ungrooved portions of the panel simulate bricks.

3,882,219

CO-EXTRUSION OF ACRYLIC ESTER POLYMER/POLYSTYRENE MULTIPLE-LAYERED SHEETING

Donald F. Wiley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Continuation of Ser. No. 128,724, March 29, 1971, abandoned. This application Aug. 10, 1973, Ser. No. 387,506
Int. Cl. B29d 7/04
U.S. Cl. 264—171 6 Claims



1. A process for the manufacture of composite sheeting having a major layer corresponding substantially to the final composite sheeting thickness of a styrene polymer selected from the group consisting of homopolystyrene, impact polystyrene and normal copolymers of styrene containing a minor amount of another copolymerizable monomer, and a minor layer constituting less than 20% of the total final thickness of an acrylic ester polymer firmly united to the exterior surface of said major layer, comprising conveying a heat plasticized stream of said styrene polymer in a conduit having a generally circular cross section, joining to the exterior surface of said styrene polymer stream within the said conduit a second, heat plasticized stream of said acrylic ester polymer, said second stream constituting less than about 20% by volume of the combined first and second streams thereby forming a single stratified stream of heat plasticized material conforming to the cross section of said conduit and being characterized by distinct, contiguous layers of said polymeric materials having a relatively sharply defined interface therebetween, said interface terminating at each end at a point on the inside surface of said conduit, adjusting the respective temperatures of the first and second streams under co-extrusion conditions to temperatures at which the melt viscosity of the acrylic ester polymer stream exhibits a value within the range of about 50 to 150% of the melt viscosity exhibited by said styrene polymer stream under the conditions of A.S.T.M. Test D–12-38–63T, conveying said composite stream undisturbed through said conduit to a sheet-form extrusion die having its die lips generally aligned in parallel with the said interface between the two polymeric materials, and passing said composite stream of molten material through the said die to form a sheet, whereby said second stream spreads laterally across said first stream thereby forming said minor layer of said composite sheeting.

3,882,220

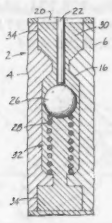
METHOD OF MOLDING UTILIZING MELTABLE CORE

Francis E. Ryder, Barrington, Ill., assignor to Ryder International Corporation, Barrington, Ill.

Continuation of Ser. No. 173,786, Aug. 23, 1971. This application Nov. 2, 1973, Ser. No. 412,506
Int. Cl. B29c 1/08
U.S. Cl. 264—221 5 Claims

1. A method of molding an article including a housing and a spring biased element held captive within said housing, said method comprising the steps of: providing a first mold having a cavity shaped to the desired inner configuration of the housing; positioning a biasing member and an element within said first mold cavity; depressing said element against said biasing member to disengage said element from any restrictions in said first mold cavity; molding a first material about said

element and biasing member while maintaining said element depressed to provide a casting including said element and said biasing member in the depressed condition; molding a second material about the casting, said second material having a higher melting point than said first material; and melting said



first material away from between said second material and said element and biasing member, while maintaining said second material solidified, thereby freeing said element to be biased into engagement with a seating surface provided by said second molded material.

3,882,221

PROCESS FOR LIQUID GAS REACTION ON ACID UNDECOMPOSABLE SILICATES

Harold W. Wilson, P.O. Box 9851, El Paso, Tex. 79989

Filed Jan. 10, 1973, Ser. No. 322,546

Int. Cl. B01j *9/04*; **C01b** *17/00*

U.S. Cl. 423—244 **29 Claims**

7. A process, as claimed in claim 6, wherein said composition contains about 12 percent by weight water.

3,882,222

PROCESS FOR PURIFYING A GAS CONTAINING OXYGENATED SULFUR COMPOUNDS AND RECOVERING SULFUR USING AMMONIA LIQUORS

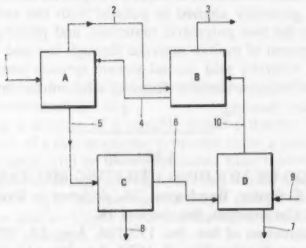
Andre Deschamps, Chatou; Claude Dezael, Maisons-Laffitte; Sigismond Franckowiack, Montesson, and Philippe Renault, Noisy-le-Roi, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Feb. 24, 1972, Ser. No. 228,830

Claims priority, application France, Mar. 9, 1971, 71.08198

Int. Cl. C01b *17/04*

U.S. Cl. 423—575 **12 Claims**



1. A process for removing sulfur dioxide from a gas containing it, wherein the gas is contacted with ammonia and water at a temperature of from 30° to 80° C so as to obtain a solution of ammonium sulfites in which the molar ratio of H_2O to ammonium sulfites (expressed as SO_2) is from 11 : 1 to 100 : 1, the solution is concentrated in a concentration zone by evaporating water at a temperature lower than 100° C so as to obtain a molar ratio of H_2O to SO_2 of 4 : 1 to 10 : 1, the resulting concentrated solution is heated up to 105°–200° C so as to convert at least the major portion of the ammonium sulfites therein into a gas mixture of sulfur dioxide, ammonia and steam, and so as to produce a more concentrated residual solution containing ammonium sulfates, said residual solution being discharged from the process, said gas mixture is then passed with hydrogen sulfide through a liquid phase consisting essentially of an organic solvent, at a temperature of from 120° to 170°C, so as to produce sulfur, said sulfur and a gas phase consisting essentially of steam and ammonia are separated from the liquid phase, and ammonia is recirculated through the zone of contact with the sulfur dioxide containing gas.

3,882,223

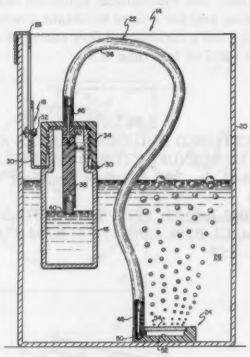
METHOD AND APPARATUS FOR CATALYTICALLY DECOMPOSING A SOLUTION FOR GENERATING OXYGEN THEREFROM

Paul W. Reinhardt, Roane County, Tenn., assignor to Acorn Associates, Inc., Oak Ridge, Tenn.

Filed Aug. 6, 1973, Ser. No. 385,635

Int. Cl. C01b *13/00*

U.S. Cl. 423—579 **9 Claims**



1. A method of generating oxygen comprising providing a water-based solution of hydrogen peroxide and an acid which reacts with lead oxide to form a reaction product selected from the group consisting of water soluble lead salts, water, gases innocuous to animal life and mixtures thereof; placing a hydrogen peroxide decomposition catalyst comprising an effective quantity of catalytically active elemental lead in contact with the solution; recovering oxygen from the solution; and minimizing degradation of catalyst performance comprising the concurrent steps of reacting the catalytic elemental lead with produced oxygen to form lead oxide and removing the lead oxide from the catalyst by reacting the same with the acid.

3,882,224

REAGENTS AND TESTS FOR SYPHILIS

Peter Salvatore Forgione, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 11, 1973, Ser. No. 396,169

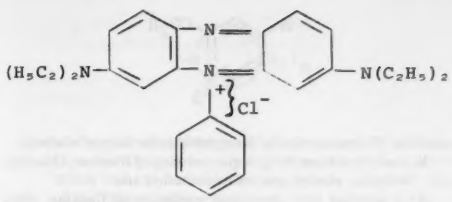
Int. Cl. G01n *31/02, 31/22, 33/16*

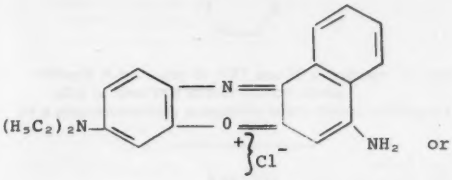
U.S. Cl. 424—8 **9 Claims**

1. An antigen preparation for use in carrying out an agglutination test for syphilis which comprises

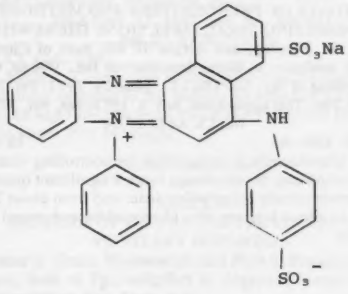
a. 0.1–25 percent by weight of a syphilis antigen reagent,

b. 0.0001–0.2 percent by weight of a dye compound comprising





or

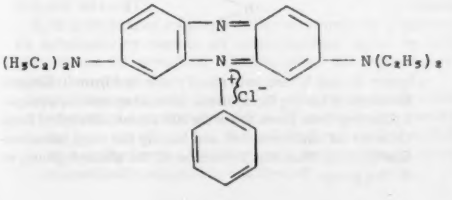


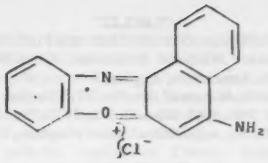
and

c. a flocculating amount of polyvinylimidazoline.

5. A method for carrying out an agglutination test for syphilis on a test card having dried thereon a test spot containing a flocculating amount of polyvinylimidazoline said method comprising contacting said test spot with

1. a test serum or plasma and
2. an antigen preparation comprising
   a. 0.1–25 percent by weight of a syphilis antigen reagent and
   b. 0.0001–0.2 percent by weight of a dye compound comprising





3,882,225

DIRECT AGGLUTINATION IMMUNOLOGICAL REAGENT

Virendra Patel, Baroda, India; Marion Cook Fetter, and Shradha Nand, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 9, 1968, Ser. No. 782,467

Int. Cl. G01n *31/00, 31/02, 33/10*

U.S. Cl. 424—12 **6 Claims**

1. An immunological indicator reagent capable of detecting an antigen selected from the group consisting of bovine serum albumin, diptheria toxoid, tetanus toxoid, and C-reactive protein, comprising a pre-polymerized aggregate of an antibody coupled to a bacterial cell with a coupling agent said; bacterial cell being of uniform shape and size selected from the group consisting of E. coli, B. subtilis, L. leichmannii, B. pumilus and P. fragi said coupling agent being selected from the group consisting of bis diazobenzidine, bis diazobenzidine disulfonic acid, acrolein, difluorodinitrobenzene, dicyclohexylcarbodiimide, cyanuric chloride, 2,7-diaminofluorene, toluene diisocyanate, dichlorotriazine, difluorodinitrodiphenyl sulfone, tetrazo-p-phenylenediamine, glutaraldehyde and N-5-butyl-5-methylisoxazolium perchlorate.

3,882,226

INSECTICIDAL COMPOSITION EMPLOYING DDVP

Francis Edward Husband Bradburne, Shaw Street Works, Lancashire, Blackburn, England

Continuation-in-part of Ser. No. 37,571, May 15, 1970, abandoned. This application Oct. 5, 1972, Ser. No. 295,271

Claims priority, application United Kingdom, Feb. 12, 1970, 26970/69

Int. Cl. A01n *9/36, 17/00*

U.S. Cl. 424—19 **1 Claim**

1. An insecticidal material comprising a porous ceramic carrier impregnated with at least an insecticidal amount of a liquid mixture of 2,2-dichlorovinyl dimethyl phosphate and from about 5 to about 20 percent by weight of a volatile water-insoluble substance selected from the group consisting of hexachloroethane, naphthalene and camphor based on the total weight of the mixture, the porosity of said ceramic carrier being sufficient to allow absorption thereby of an insecticidal amount of the liquid mixture.

3,882,227

INSECTICIDAL COMPOSITION EMPLOYING DDVP

Francis Edward Husband Bradburne, Shaw Street Works, Blackburn, Lancashire, England

Continuation-in-part of Ser. No. 37,571, May 15, 1970, abandoned. This application Oct. 5, 1972, Ser. No. 295,272

Claims priority, application United Kingdom, Feb. 12, 1970, 26970/69

Int. Cl. A01n *9/36, 17/00*

U.S. Cl. 424—19 **1 Claim**

1. An insecticidal material comprising a porous ceramic carrier impregnated with at least an insecticidal amount of a liquid mixture of 2,2 dichlorovinyl dimethyl phosphate and from about 5 to about 20 percent by weight of paradichlorobenzene based on the total weight of the mixture, the porosity of said ceramic carrier being sufficient to allow absorption thereby of an insecticidal amount of the liquid mixture.

3,882,228

ANALGESIC FORMULATIONS

Graham Arthur Boncey, Cowley; Maurice John Hedge, Windsor, and James Rae Henderson, High Wycombe, all of England, assignors to Aspro-Nicholas, Limited, Slough, England

Filed Nov. 23, 1970, Ser. No. 92,284

Claims priority, application United Kingdom, Nov. 28, 1969, 58203/69

Int. Cl. A61k *9/00, 27/00*

U.S. Cl. 424—35 **5 Claims**

1. Free flowing readily wetable coated aspirin particles, of which at least 95 percent by weight are not more than 150 microns, comprising: one part of aspirin to one to one ninth part of a coating agent comprising at least one ingredient selected from glycine, methionine, sucrose, lactose, arabino galactan sugar products, mannitol, inositol and sorbitol; said coating agent also comprising up to five percent by weight of a wetting agent; and up to ten percent by weight of a film forming agent selected from hydroxy ethyl cellulose, hydroxy propyl methyl cellulose, sodium carboxy methyl cellulose, starches, dextrin, dextran, gum acacia, gum tragicanth and poly vinyl pyrrolidone.

3,882,229

COMPOSITION AND METHOD FOR SHRINKING MUCOUS MEMBRANES

Hans-Joachim May, Moorrege/Holstein, and Alex Berg, Eschershausen, both of Germany, assignors to Nordmark-Werke GmbH, Hamburg, Germany

Continuation of Ser. No. 273,779, July 21, 1972, abandoned. This application Nov. 8, 1973, Ser. No. 413,778

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **3 Claims**

1. The method of reducing the swelling of human mucous membrane which comprises contacting the mucous membrane with an aqueous solution containing an effective amount of 2-(4-indanylamino)-2-imidazoline or a pharmaceutically acceptable acid addition salt thereof.

3,882,230

SUBSTITUTED BENZOIC ACID HYPOLIPEMIC AGENTS

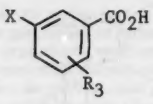
Gerald Fagan Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 304,528, Nov. 7, 1972, which is a division of Ser. No. 155,209, June 21, 1971. This application May 3, 1974, Ser. No. 466,776

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 **3 Claims**

1. A method for reducing blood lipid levels which comprises administering to a hyperlipemic mammal a hypolipemic effective amount of a compound selected from the group consisting of those of the formula



and the pharmaceutically acceptable salts thereof wherein

X is selected from the group consisting of fluorine, chlorine, bromine, methyl and trifluoromethyl and

R_3 is selected from the group consisting of fluorine, chlorine, bromine and methyl.

3,882,231

ANTIVIRAL COMPOSITIONS CONTAINING BIS-BASIC KETONES OF PHENOXATHINS AND METHODS OF INHIBITING VIRAL INFECTIONS THEREWITH

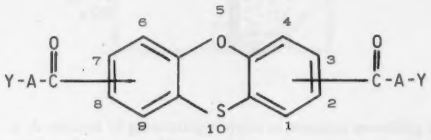
Robert W. Fleming, and Arthur D. Sill, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 158,122, June 29, 1971, Pat. No. 3,808,206. This application July 9, 1973, Ser. No. 377,572

Int. Cl. A61k *27/00*

U.S. Cl. 424—85 **18 Claims**

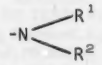
1. A pharmaceutical composition for controlling viral infections comprising, in unit dosage form, a significant quantity of a pharmaceutically acceptable carrier and from about 2 milligrams to about 3 grams of a phenoxathiin compound of the formula



wherein the

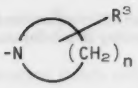
groups are attached at the 1,6-, 1,9-, 2,7-, 2,8-, 3,7- or 4,6-positions of the phenoxathiin radical; A is a straight or branched alkylene chain having from one to six carbon atoms; and each Y is selected from

A. the group



wherein R^1 and R^2 are individually selected from hydrogen, lower alkyl having from one to six carbon atoms, cycloalkyl having from three to six carbon atoms, alkenyl of from three to six carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group; or

B. the group



wherein *n* is a whole integer of from 4 to 6 and R^3 is selected from hydrogen, lower alkyl of from one to four carbon atoms and can be linked to any one of the carbon atoms of the heterocyclic group; or

C. the group

wherein X is oxygen or NR^4, and R^4 is hydrogen or lower alkyl of from one to four carbon atoms;

or a pharmaceutically acceptable acid addition salt thereof.

3,882,232

METHOD OF COMBATING HYPOMAGNESEMIA IN CATTLE

Robert A. Pendergrast, Atlanta, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1973, Ser. No. 396,951
Int. Cl. A61k *27/00*
U.S. Cl. 424—158 **7 Claims**

1. Method of combating hypomagnesemia in foraging cattle comprising applying to the pasture an effective amount of a slurry of MgO and clay in a ratio of MgO to clay of from about 2:1 to about 20:1 by weight.

3,882,233

METHODS OF INCREASING PRODUCTION OF PITUITARY HORMONES

Norman H. Grant, Wynnewood, and Ruth S. Rappaport, Strafford, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed July 27, 1973, Ser. No. 383,414
Int. Cl. A61K *17/08;* **C12D** *5/00, 13/06*
U.S. Cl. 424—177 **9 Claims**

1. A method of stimulating the in vitro secretion of at least one pituitary hormone selected from the class consisting of growth hormone, prolactin, luteinizing hormone and thyrotropin which comprises contacting cultured pituitary cells with an effective concentration of cholera enterotoxin.

3,882,234

METHOD OF TREATING ARRHYTHMIAS WITH N-(2-DIETHYLAMINO)ETHYL-α-(5,5-DIPHENYLHYDANTOIN-3-YL)ACETAMIDE

Herbert John Havera, Edwardsburg, Mich., and Wallace Glenn Strycker, Goshen, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 351,319, April 16, 1973, Pat. No. 3,835,151. This application Apr. 3, 1974, Ser. No. 457,455
Int. Cl. A61k *15/12*
U.S. Cl. 424—273 **3 Claims**

1. In a method of treating cardiac arrythmias in a mammal by administering thereto an antiarrhythmic agent by oral, intravenous, or parenteral administration, the improvement which comprises:

administering to said mammal an effective antiarrhythmic amount of a compound selected from the group consisting of N-(2-diethylamino)ethyl-α-(5,5-diphenylhydantoin-3-yl)acetamide and a nontoxic, pharmaceutically acceptable salt thereof.

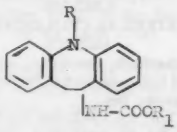
3,882,235

FUNGICIDAL COMPOSITIONS COMPRISING A 10, 11 DIHYDRODIBENZO [B,F] AZEPINE DERIVATIVE

Jean Fouché, Bourg-la-Reine, and André Léger, Massy, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 48,450, June 22, 1970, Pat. No. 3,792,042. This application Aug. 1, 1973, Ser. No. 384,419
Claims priority, application France, June 24, 1969, 69.21176; Apr. 9, 1970, 70.12838
Int. Cl. A01n *9/22*
U.S. Cl. 424—244 **8 Claims**

1. A fungicidal composition comprising, as active ingredient, a fungicidally effective amount of a 10,11-dihydrodibenzo [b,f] azepine derivative of the formula



wherein R represents hydrogen or alkyl of 1 through 5 carbon atoms and R_1 represents alkyl of 1 through 7 carbon atoms in association with a diluent or adjuvant compatible with the dihydrodibenzoazepine derivative and suitable for use in agricultural fungicidal compositions, the quantity of dihydrodibenzoazepine derivative in the composition being between 80 and 0.0005% by weight of the composition.

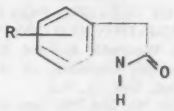
3,882,236

PHARMACEUTICAL COMPOSITIONS CONTAINING SUBSTITUTED 2-OXO-INDOLINES AND THE USE THEREOF TO TREAT ANXIETY AND TENSION

Bryan B. Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 26, 1973, Ser. No. 427,947
Int. Cl. A61u *27/00*
U.S. Cl. 424—274 **16 Claims**

8. A method of treating a patient to relieve anxiety and tension, which comprises administering to said patient a pharmaceutically effective amount of an oxo-indoline of the formula



in which R is C_1–C_3 alkyl, C_1–C_3 alkoxy, halo, or trifluoromethyl.

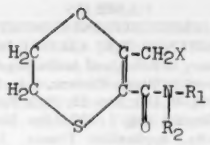
3,882,237

2-(SUBSTITUTED-METHYL)-5,6-DIHYDRO-1,4-OXATHIIN-3-CARBOXAMIDES USED AS FUNGICIDES

Barry I. Knight; Michael Curcumelli-Rodostamo; Marshall Kulka, all of Guelph, Ontario, Canada, and Bogislav Von Schmeling, Hamden, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Quebec, Canada

Division of Ser. No. 78,344, Sept. 8, 1970, Pat. No. 3,728,357. This application Dec. 18, 1972, Ser. No. 316,176
Int. Cl. A01n *9/12*
U.S. Cl. 424—276 **4 Claims**

1. A method of controlling the fungus causing early blight of tomato plants comprising applying to said plants, a fungicidally effective amount of a 2-(substituted-methyl)-5,6-dihydro-1,4-oxathiin-3-carboxamide compound of the formula:



wherein R_1 is hydrogen, methyl or ethyl, R_2 is phenyl, methylphenyl, methoxyphenyl, cyclohexyl, or tertiary octyl and X is chloro.

3,882,238

SULFONATE ESTERS AS CHOLESTEROL-LOWERING AGENTS

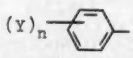
Forrest W. Quackenbush, Brookston, and Phillip G. Rand, Elkhart, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Nov. 13, 1972, Ser. No. 306,083
Int. Cl. A01n *9/14, 9/20*
U.S. Cl. 424—303 **11 Claims**

1. A process for reducing the blood cholesterol concentration in a warm-blooded animal exhibiting hypercholesterolemia which comprises administering to said animal in an amount sufficient to lower said cholesterol concentration a compound of the formula

$$R''—SO_3—R'$$

in which R'' is cyclohexadienyl, naphthyl, indanyl, cyclohexyl, or



in which *n* is zero or an integer from 1 to 3, and each Y independently is C_1-C_{20} alkyl, phenyl, halo, C_1-C_3 alkoxy, C_2-C_3 alkenyl, carboxy, nitro, halomethyl, or phenylazo; and R' is a saturated or unsaturated hydrocarbon group having from 8 to 20 carbon atoms, at least 8 carbon atoms of which are in a straight chain, and said group is bonded to the sulfonyl function through a primary or secondary carbon atom.

3,882,239

METHOD OF TREATING PAIN FEVER AND INFLAMMATION AND COMPOSITION

Tsung-Ying Shen, Westfield; Howard Jones, Holmdel, and Michael W. Fordice, Cranford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 286,798, Sept. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 108,629, Jan. 21, 1971, abandoned. This application June 13, 1974, Ser. No. 479,014
Int. Cl. A61k *27/00*
U.S. Cl. 424—303 **2 Claims**

1. A method of treating pain, fever and inflammation which comprises administering to a host a therapeutically effective amount of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-3-indenyl-β-ethanol.

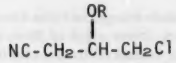
3,882,240

METHOD FOR PRODUCING INFERTILITY IN MALE RATS

Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 93,382, Nov. 27, 1970, abandoned. This application Mar. 30, 1973, Ser. No. 346,493
Int. Cl. Aoln *9/20*
U.S. Cl. 424—304 **3 Claims**

1. A method for producing epididymal lesions and infertility in fertile male rats which comprises the oral administration to a fertile male rat of an effective amoumt for producing epididymal lesions an infertility of a compound of the formula:



Wherein R is a member selected from the group consisting of hydrogen and acyl of hydrocarbon carboxylic acid of from 1 to 18 carbon atoms, inclusive, in association with an edible orally acceptable carrier.

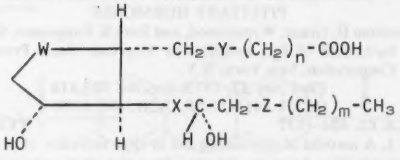
3,882,241

USE OF PROSTAGLANDINS E AND F FOR PREVENTION OF PREGNANCY IN HUMANS

Bruce B. Pharriss, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 881,296, Dec. 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 756,294, Aug. 9, 1968, abandoned. This application Feb. 7, 1973, Ser. No. 330,351
Int. Cl. A61k *27/00*
U.S. Cl. 424—305 **9 Claims**

1. A method of preventing pregnancy in an ovulating human which consists essentially of providing to a said human in a span of time beginning at or about the time of ovulation and ending at or about the time of next expected heat or menses an effective amount for preventing pregnancy of a member selected from the group consisting of the free acids, pharmaceutically acceptable salts, and alkyl esters having one to 6 carbon atoms, inclusive, in the alkyl portion, of a compound represented by the formula



wherein W is =C=O or

X is CH_2CH_2 or trans CH=CH and both Y and Z are CH_2CH_2; X is trans CH=CH, Y is cis CH=CH and Z is CH_2CH_2 or cis CH=CH; *m* is 0, 1 or 2 and *n* is 2, 3, 4 or 5, in a dosage unit form compounded with pharmaceutical means which adapt the form for systemic administration.

3,882,242

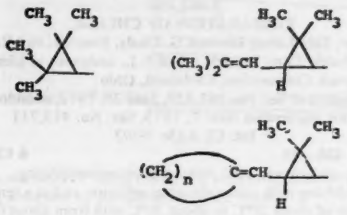
INSECTICIDAL ESTERS OF 1-ACENAPHTHENOL

Robert J. Crawford, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

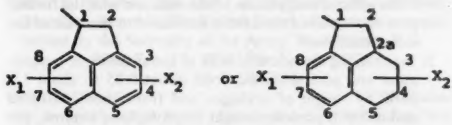
Division of Ser. No. 198,434, Nov. 12, 1971, Pat. No. 3,840,584. This application May 15, 1974, Ser. No. 469,994
Int. Cl. A01n *9/24*
U.S. Cl. 424—305 **2 Claims**

1. A process for combatting insects comprising applying to said insects, or to their habitat, an insecticidally effective amount of a cyclopropanecarboxylic acid ester of the formula

wherein R is a cyclopropane moiety selected from the group consisting of



wherein *n* is an integer of from 4 to 6 and wherein R′ is a 1-acenaphthenyl or tetrahydro-1-acenaphthenyl moiety of the formula



wherein X_1 and X_2 are each selected from the group consisting of hydrogen, halogen, nitro, thiomethyl, straight or branched chain alkyl containing from about 1 to 5 carbon atoms, alkoxyl containing from about 1 to 2 carbon atoms and sulfonylmethyl.

3,882,243

AQUEOUS SUSPENSIONS OF STABLE NON-BETA TYPE CRYSTALS OF HIGHER FATTY ACID ESTERS OF CHLORAMPHENICOL

Tadao Maeda, Minoo; Tomoaki Kiyotaki, Ibaraki; Yasuo Katsuhara, Kobe; Takayoshi Mitsunaga, Takatsuki, and Mitsuo Iwade, Settsu, all of Japan, assignors to Sumitomo Chemical Company Limited

Filed Aug. 18, 1972, Ser. No. 281,941
Claims priority, application Japan, Feb. 4, 1972, 47-13190
Int. Cl. A61k *21/00*
U.S. Cl. 424—312 **3 Claims**

1. A stabilized aqueous suspension of a non-β-type chloramphenicol myristate, palmite or stearate crystals which comprises an aqueous suspension of said crystals and 0.1 to 20 % by weight based on the weight of chloramphenicol myristate, palmitate or stearate, of either a sucrose ester of a fatty acid selected from the group consisting of stearic acid, palmitic acid, myristic acid, oleic acid and mixtures of stearic and palmitic acids, or a sucrose ester of a mixed fatty acid derived from beef tallow, lard, lanolin, coconut oil, castor oil or safflower oil; said sucrose ester having an HLB value of 7 to 17.

3,882,244

METHOD OF TREATING ACNE WITH A C20 ACID

Kwan-Hua Lee, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 207,623, Dec. 13, 1971, abandoned. This application Mar. 21, 1973, Ser. No. 343,559
Int. Cl. A61k *27/00*
U.S. Cl. 424—318 **1 Claim**

1. A method of treating an acne condition comprising: applying topically to the affected area of a patient having an acne condition, an amount effective for treating said acne condition, of 2,6,6-trimethyl-1-(10′-carboxy-deca-1′, 3′,5′,7′,9′-pentaenyl)cyclohex-1-ene in combination with a physiologically acceptable carrier.

3,882,245

USE OF PROSTAGLANDINS IN COMBATING SHOCK

Donald W. Du Charme, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 302,714, Nov. 1, 1972, abandoned, which is a continuation of Ser. No. 159,561, July 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 884,017, Dec. 10, 1969, abandoned, which is a continuation-n-part of Ser. No. 622,029, March 10, 1967, abandoned. This application Nov. 23, 1973, Ser. No. 418,501
Int. Cl. A61k *27/00*
U.S. Cl. 424—318 **8 Claims**

1. A method of combating shock which consists essentially of administering parenterally to a mammal in shock a pharmaceutical form supplying a nontoxic effective amount of a prostaglandin selected from the group consisting of an A-type prostaglandin, and E-type prostaglandin, an F-type prostaglandin, and pharmaceutically acceptable salts thereof.

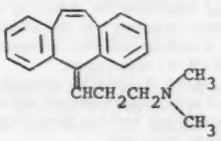
3,882,246

TREATMENT OF SKELETAL MUSCLE DISORDERS WITH CYCLOBENZAPRINE

Nathan Norman Share, Cote St. Luc, Quebec, Canada, assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. Nos. 145,875, May 21, 1971, abandoned, and Ser. No. 328,192, Jan. 31, 1973, abandoned. This application Apr. 9, 1974, Ser. No. 459,748
Int. Cl. A61k *27/00*
U.S. Cl. 424—330 **5 Claims**

1. A method for treating patients afflicted with disorders involving skeletal muscle hypertonic activity selected from the group consisting of muscle spasm, muscle spasticity, muscle rigidity or muscle splinting which comprises administering to said patient a therapeutically effective and safe dosage of cyclobenzaprine of the formula



or a pharmaceutically acceptable non-toxic acid addition salt thereof in an amount between 0.05 to 5 mg./kg./day of said cyclobenzaprine or salt to selectively reduce skeletal muscle hypertonic activity without significantly reducing normal muscle strength or coordination.

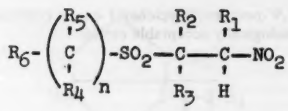
3,882,247

FUNGICIDAL NITRO ORGANIC SULFUR COMPOUNDS

Greg A. Bullock, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 246,495, April 21, 1972, Pat. No. 3,792,093. This application Nov. 1, 1973, Ser. No. 412,039
Int. Cl. A01n *9/00, 9/12*
U.S. Cl. 424—337 **19 Claims**

1. The method for protecting a locus from damage by fungi comprising applying a fungicidally effective amount to the locus to be protected of a compound of the formula:



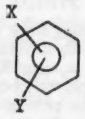
where

R_1 and R_2 are each independently hydrogen or alkyl of 1–4 carbon atoms;

R_3 is alkyl of 1–4 carbon atoms or phenyl; and

$R_4$and R_5 are each independently hydrogen or methyl;

R_6 is alkyl of 1–6 carbon atoms, cycloalkyl of 1–6 carbon atoms, alkylcycloalkyl of 4–7 carbon atoms, cycloalkylalkyl of 4–7 carbon atoms, 1- or 2-naphthyl or



wherein

X is hydrogen, halogen, hydroxyl, alkyl of 1–12 carbon atoms, nitro, or alkoxy of 1–4 carbon atoms; and

Y is hydrogen, halogen, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms

with the provision that the total number of carbon atoms in X and Y may not exceed 12;

n is 0 or 1 provided that when R_6 is other than aryl, n is 0 and R_3 must be alkyl of 1–4 carbon atoms.

3,882,248

GALLSTONE SOLUBILIZER

Hirotsune Igimi, and Hiroyuki Ide, both of Fukuoka, Japan, assignors to Hisamitsu Pharmaceutical Company, Inc., Tosu-shi, Japan

Continuation-in-part of Ser. No. 237,918, March 12, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 437,202

Int. Cl. A61k *27/00*

U.S. Cl. 424—356 **2 Claims**

1. A gallstone solubilizer for dissolving cholesterol-type gallstones by direct injection into the affected parts of the patient through a medical cathether, comprising:

a. 99.8 – 70% (W/V) of limonene;

b. 0.1 – 15% (W/V) of a member selected from the group consisting of sorbitan monolaurate, sorbitan monooleate and polyoxyethylene sorbitan monooleate having about 20 oxyethylene units; and

c. 0.1 – 15% (W/V) of a member selected from the group consisting of ethanol and water.

3,882,249

METHOD FOR THE DEODORIZATION AND BLOOD-REMOVAL OF MEATS AND FISH EGGS

Ryutaro Fukazawa, Tokyo, Japan, assignor to Sankyo Company Limited, Tokyo, Japan

Filed June 28, 1973, Ser. No. 374,418

Claims priority, application Japan, July 27, 1972, 47-75260

Int. Cl. A22c *18/00, 25/00*

U.S. Cl. 426—7 **8 Claims**

1. A method for the deodorization and blood-removal of flesh meat, marine animal meat and fish egg which comprises treating a raw flesh meat, a raw marine animal meat or a raw fish egg by immersing said meat or egg into an aqueous solution containing lipase and a water-soluble salt of citric acid, wherein the concentration of said lipase in said solution is from 1×10^3 to 1×10^5 units per liter of said solution and the concentration of said water-soluble salt is from 0.5 to 3.0 in said solution said period of time for the immersion being from about 0.5 to about 6 hours.

3,882,250

PREPARATION OF CHEESE

Ira Loter, Fair Lawn; Howard G. Dissly, Summit, and Robert E. Schafer, Long Branch, all of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation of Ser. No. 267,239, June 28, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,711

Int. Cl. A23c *19/02*

U.S. Cl. 426—39 **6 Claims**

1. An acid cheese curd making process comprising:

A. acidifying milk under vigorous agitation and at a temperature of about 20°C to about 30°C with from about 0.3 to about 1.0 parts by weight of 10 to 90 percent free acid aqueous solution per 100 parts by weight of milk to obtain an acidified milk with a pH reduced to about 5.15 and then adding additional free acid aqueous solution at a slower rate until the pH of the milk is reduced to about 5.00, without coagulation of the milk and with the further proviso that all of the acid is not added to the milk at the same time; then

B. maintaining the acidified milk at about the same temperature and adding thereto from about 0.25 to about 1.0 parts by weight of acidogen and from about 0.015 to about 0.050 parts by weight of proteolytic enzyme, per 100 parts by weight of milk; and thereafter

C. allowing the milk to stand quiescent at about the same temperature for from about 30 minutes to about 4 hours, so as to form an acid cheese curd suitable for making cottage cheese, baker's cheese, quark cheese, cream cheese, and Neufchatel cheese.

3,882,251

IRON ENRICHMENT OF FLOUR

Alexis D. Bell, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 199,734, Nov. 17, 1971, Pat. No. 3,803,292, which is a continuation-in-part of Ser. No. 110,655, Jan. 28, 1971, abandoned. This application Mar. 19, 1974, Ser. No. 452,630

Int. Cl. A21d *2/28*

U.S. Cl. 426—72 **6 Claims**

1. The method for fortifying flour with iron which comprises intimately mixing with flour a nutritionally acceptable level of a finely divided iron composition, the particles of which consist essentially of ferrous sulfate monohydrate with a surface coating of ferrous sulfate heptahydrate.

3,882,252

SHIRRED SAUSAGE CASING CLOSED AT ONE END AND METHOD OF MAKING SAME

Bruno Winkler, Oberflockenbach, Germany, assignor to Naturin-Werk Becker & Co., Weinheim, Germany

Filed Feb. 13, 1973, Ser. No. 331,755

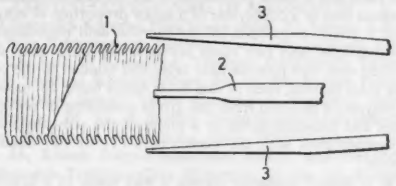
Claims priority, application Germany, Feb. 16, 1972, 2207218; Sept. 28, 1972, 2247515

Int. Cl. A22c *13/00*

U.S. Cl. 426—140 **14 Claims**

1. A shirred food casing suitable for holding sausage meat closed at one end comprising a food casing material, the closure being an end portion of the casing compressed to provide compressed folds adjacent the axis of the casing, the closure being at least partially sealed by a physiologically

tolerable adhesive placed between the compressed folds, the seal being strong enough to withstand the pressure occurring



at the moment of filling the casing with food, and the adhesive being softened by juice from sausage meat.

3,882,253

DIRECTLY EDIBLE AND RAPIDLY REHYDRATABLE COMPACTED AND DEHYDRATED FOOD BAR AND METHOD OF MAKING THE SAME

Glenn R. Schafer, and Abdul R. Rahman, both of Natick, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1974, Ser. No. 443,071
Int. Cl. A23b *7/02*
U.S. Cl. 426—637 **10 Claims**

1. A rapidly rehydratable, compacted, dehydrated food bar comprising discrete particles of blanched and freeze-dried potatoes substantially uniformly mixed with non-potato food bar-forming ingredients in the approximate proportion of about 10 to about 20 percent of said particles of potatoes to about 90 to about 80 percent of said non-potato food bar-forming ingredients, said percentages being by weight, said potato particles having volumes of from about 1/64 cubic inch to about ⅛ cubic inch when mixed with said non-potato food bar-forming ingredients, said compacted, dehydrated food bar having a bulk density from about 1.0 to about 1.4 gm per cc and a moisture content of from about 1 percent to about 4 percent by weight.

3,882,254

PEANUT BUTTER

Chester Martin Gooding, Westfield, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 31, 1973, Ser. No. 411,524
Int. Cl. A23l *1/38*
U.S. Cl. 426—633 **2 Claims**

1. A peanut butter composition having improved spreadability, improved melt down in the mouth and resistance to oil bleeding and gravitational separation comprising peanut butter and a non-hydrogenated refined and bleached hard fraction separated from palm oil in an amount sufficient to provide an SCI value in solution with peanut oil of from about 2.0 to about 3.0 at 80°F and from about 1.5 to 2.5 at 92°F.

3,882,255

METHOD FOR PREPARING FLAVORED POPCORN

Robert D. Gorham, Jr., Rocky Mount, N.C.; Lawrence D. Lorah, Concord, and F. Gordon Willis, Jr., Winchester, all of Mass., assignors to Robert D. Gorham, Jr., Rocky Mount, N.C.

Filed May 3, 1973, Ser. No. 356,969
Int. Cl. A23l *1/10*
U.S. Cl. 426—235 **14 Claims**

1. A method for preparing popcorn having at least one selected flavor and employing a cooking, flavoring and dispensing apparatus and including the steps of:

dry cooking kernels of poppable corn in a cooking chamber to provide popped popcorn having no cooking oil residue thereon;

dispensing said cooked popcorn from said cooking chamber into a flavoring chamber and causing said popcorn to traverse a travel path along which said popcorn is prevented from contacting any surface of said flavoring chamber;

applying at least one selected flavoring substance to the cooked popcorn at a location within said flavoring chamber and along said travel path; and

dispensing the flavored popcorn through a dispensing channel defined by said travel path whereby said cooked flavored popcorn does not contact the walls of said dispensing channel thereby preventing contamination of the dispensing channel by the flavoring substance.

3,882,256

METHOD FOR THE PREPARATION OF A MILK PROTEIN COPRECIPITATE

Rudolf De Boer, Wageningen, Netherlands, assignor to Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek, Wageningen, Netherlands

Filed Nov. 14, 1972, Ser. No. 306,192
Claims priority, application Netherlands, Nov. 15, 1971, 7115702
Int. Cl. A23j *3/00;* **A23c** *21/00;* **A21d** *2/26*
U.S. Cl. 426—583 **10 Claims**

1. Method for the preparation of a milk protein coprecipitate being high in the ability to impart to cereal doughs baking qualities such as dough workability, crispness on baking and good flavor and nutritional value and low in lactose content, comprising the steps providing a mixture comprising at least one member from the group consisting of 2–10 parts by weight of whey, an amount of concentrated whey having the same solids content as 2 to 10 parts of whey and 0.2 to 1 part by weight of residual mother liquors of whey from lactose production (having a solids content of 30–35 percent by weight) and 1 part by weight of buttermilk or skimmed milk, adjusting the pH of said mixture to a value of 6.5–7.1 by heating it to at least 80°C. for at least 5 minutes before, during or after the addition of 0.1–1.0 percent by weight of the mixture of $CaCl_2$, washing the coprecipitate thus formed with water, thereafter resuspending the coprecipitate in water while admixing therewith an aqueous solution of a polyphosphate in such an amount that after drying the composition will have a NSI (Nitrogen Solubility Index) between 4 and 11 percent.

3,882,257

PREPARATION OF PET FOOD FROM BONES AND ANIMAL BY-PRODUCTS

J. Douglas Cagle, East Point, Ga., assignor to Cagle's, Inc., Atlanta, Ga.

Continuation of Ser. No. 155,268, June 21, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 392,041
Int. Cl. A23k *1/10*
U.S. Cl. 426—274 **1 Claim**

1. A method of preparing a pet food product comprising the steps of:

a. forming a mixture yielding a finsihed product containing approximately 40 percent natural animal protein by mixing 75 percent by weight of bones of various animals with 23.5 percent by weight of animal by-products selected from the group consisting of livers, skins, lungs, hearts, kidneys, heads, feet and mixtures thereof;

b. cutting and chopping the mixture of step (a) to form an uncoagulated mass;

c. adding salt to said uncoagulated mass in amount sufficient to combine with the protein content thereof and form a binder, said salt being added in amount of 1.5 percent by weight;

d. mixing the uncoagulated mass of step (b) and the added salt of step (c) to form a cohesive mass having the appearance and behavior of a unitary product;

e. de-aerifying the cohesive mass of step (d) to remove any air bubbles trapped therein;
f. compressing and forming the de-aerified cohesive mass into discrete and separate masses; and
g. dehydrating said discrete and separate masses at a temperature of 90°F – 140°F to yield said finished product containing approximately 40 percent natural animal protein and having a moisture content between 6 and 8 percent by weight.

3,882,258

DRY PREPARED FLUFFY FROSTING MIXES

Ronald David Harris, Wyoming, and Richard Morris Roudebush, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 5, 1973, Ser. No. 329,477
Int. Cl. A23g *3/00*
U.S. Cl. 426—572 **9 Claims**

1. A process for making a dry prepared fluffy frosting mix which comprises the steps of:
a. melting and flaking a polyglycerol ester containing from about 2 to about 12 glycerol units and from about 1 to about 4 fatty acid groups per molecule;
b. pulverizing said polyglycerol ester to a small particle size while maintaining the polyglycol ester at a temperature below its melting point;
c. blending said pulverized polyglycerol ester with a dry mixture comprising sugar, and flavoring; and
d. pulverizing the resulting blend to such an extent that 95 percent of the particles will pass through an 80 mesh screen and 5 percent of the particles will pass through a 100 mesh screen.

3,882,259

LAMINATE OF ETHYLENE/VINYL ALCOHOL COPOLYMER, ETHYLENE/VINYL ACETATE COPOLYMER AND POLYOLEFINS

Shigezo Nohara; Shunsaku Hirata, both of Yokohama; Jinichi Yazaki, Kawasaki, and Toru Suzuki, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Mar. 30, 1973, Ser. No. 347,406
Claims priority, application Japan, Aug. 8, 1972, 47-78732
Int. Cl. B32b *27/08, 31/30*
U.S. Cl. 428—35 **9 Claims**

1. A laminated composite sheet consisting essentially of an intermediate layer composed of a mixture of an ethylene-vinyl alcohol copolymer and a member selected from the group consisting of (1) an ethylene-vinyl acetate copolymer and (2) an ionomer which is a copolymer of a major proportion of ethylene and a minor proportion of acrylic acid neutralized by sodium ions or a copolymer of a major proportion of ethylene and a minor proportion of methacrylic acid neutralized by sodium ions; and two outer layers which have been coextruded with said intermediate layer and bonded to the opposite sides thereof, each of said outer layers being composed of a polyolefin selected from the group consisting of polyethylenes and polypropylenes or a blend of the polyethylenes or polypropylenes with the copolymers (1) or (2) described above.

8. A hollow container having a wall made of a laminated materials as defined in claim **1.**

3,882,260

METHOD OF COATING SHAPED ARTICLES

Heinz Mueller-Tamm; Wolfgang Immel, both of Ludwigshafen; Heinrich Mohr, and Karl-Heinz Fauth, both of Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 7, 1973, Ser. No. 330,307
Claims priority, application Germany, Feb. 11, 1972, 2206509
Int. Cl. C23c *3/00;* **B44d** *1/09*
U.S. Cl. 428—337 **5 Claims**

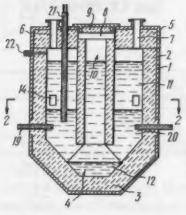
1. A method of coating shaped articles of polyisobutylene having a molecular weight of from 3×10^5 to 6×10^6 (viscosity average) which comprises applying to the surface of said shaped article as a coating composition from 10 to 2000 g/m² of shaped article surface of molten polyethylene, polypropylene, ethylene/propylene copolymer or mixtures of said polymers having a molecular weight of from 2,000 to 20,000.

2. A method as set forth in claim **1** wherein said shaped articles are heated in a stream of hot air prior to the coating step whereby the temperature of the shaped articles is at least 5°C above the melting point of the coating composition.

3,882,261
ELECTRIC FURNACE AND METHOD FOR THE CONTINUOUS REFINING OF MAGNESIUM

Sergei Petrovich Kosarev, Nalichnaya ulitsa, 39, korpus 1, kv. 20; Nina Voldemarovna Didrikh, Moskovsky prospekt 220, kv. 26, both of Leningrad; Vladimir Dmitrievich Yazev, ulitsa Bogdana Khmelnitskogo, 66, kv. 59, Kalush Ivano-Frankovskoi oblasti; Viktor Georgievich Raskatov, ulitsa Khimikov, 14, kv. 8, Kalush Ivano-Frankovskoi oblasti; Oleg Nikolaevich Romanenko, ulitsa Sevastopolskaya, 96, kv. 46, Kalush Ivano-Frankovskoi oblasti, and Alexandr Fedorovich Trukhin, ulitsa Zhdanova, 11, kv. 32, Kalush Ivano-Frankovskoi oblasti, all of U.S.S.R.

Filed May 2, 1974, Ser. No. 466,493
Int. Cl. H05b *3/60*
U.S. Cl. 13—23 **14 Claims**



1. A furnace for the refining of a metal, such as magnesium and the like having a refractory lined bottom, side walls and a roof and comprising: vertically disposed partition means dividing said furnace into a centrally disposed chamber and a plurality of chambers disposed peripherally about said central chamber, said central chamber having removable cover means, and being sealed with respect to said peripheral chambers by means of a molten salt mass when said furnace is in operation; all of said chambers communicating with each other at their lower portions; each of said peripheral chambers communicating with an adjacent peripheral chamber at a level in said furnace so as to ensure the consecutive overflow of refined metal from a first peripheral chamber to a last peripheral chamber, and opening means in said roof for charging said furnace and for discharging said refined metal.

3,882,262
MODULAR ELECTRICAL PENETRATION

Renzo L. Korner, Horseheads; David Green, Corning; Albert Bereza, Elmira, and Robert J. Colegrove, Horseheads, all of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1974, Ser. No. 432,375
Int. Cl. G21c *13/02;* **H01b** *17/26*
U.S. Cl. 174—11 R **8 Claims**

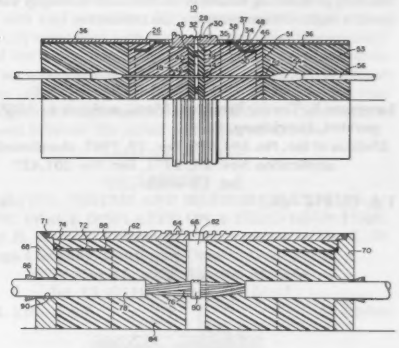
1. An electrical penetration assembly comprising:

a. an enclosure defining metal member;

b. a pair of axially aligned annular seal shroud means disposed within the enclosure defined by the metal member, each of said annular seal shroud means comprising a sealing end which is sealingly connected to the interior surface of the metal member, and a free end which is spaced from the enclosure defining metal member which free end has an outer surface generally parallel to the interior surface of the metal member;

c. at least one longitudinally extending electrical conductor extending through said enclosure defined by said metal member, and passing through both of the annular seal shroud means;

d. a chemically stable, radioactive resistant, gas inpervious, compressive setting, resinous potting material substantially filling the enclosure defined by said metal member, and providing a compression seal along and about the

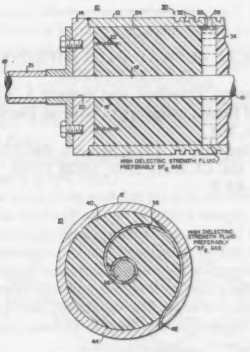


conductor, and about the outer surface of the free end of each of the seal shroud means.

3,882,263
ELECTRICAL PENETRATION FOR WITHSTANDING VOLTAGE SURGE ON THE CONDUCTOR

Renzo L. Korner, Horseheads, and David Green, Corning, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1974, Ser. No. 457,685
Int. Cl. G21c *13/02;* **H01b** *17/26*
U.S. Cl. 174—11 R **4 Claims**



1. In an electrical penetration assembly comprising a metal enclosure member, a pair of axially aligned annular seal shroud means disposed within the enclosure defined by the metal member, each of said annular seal shroud means including a sealing end which is sealingly connected to the interior surface of the metal member, and a free end which is spaced from the metal member, which free end has another surface generally parallel to the interior surface of the metal member, at least one longitudinally extending electrical conductor extending through the enclosure and passing through the annular seal shroud means, a compressive setting resinous potting material substantially filling the enclosure which pot-

ting material has spaced apart portions forming a centrally located leak monitoring chamber, and an aperture is provided through said metal enclosure member interconnected with the leak monitoring chamber, the improvement wherein a fluid having a dielectric strength substantially greater than air fills the leak monitoring chamber so that said assembly can withstand a high voltage surge on the conductor.

3,882,264

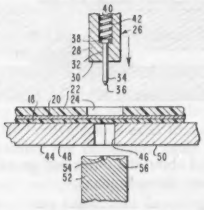
EYELET IN FLEXIBLE CIRCUITRY

Lawrence R. Travis, Brockton, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 694,476, Dec. 29, 1967, abandoned. This application Nov. 23, 1971, Ser. No. 201,427

Int. Cl. H05k *1/02*

U.S. Cl. 174—68.5 **1 Claim**



1. An integral eyelet in flexible circuitry which circuitry comprises thin, flexible conductive foil bonded to a surface of thin flexible, insulative, plastic backing, said eyelet including an opening defined through said foil and backing with the peripheral portion of said foil and said backing about said opening bent backwards upon itself, with the backing in contact with itself and with the foil exposed about the periphery of said opening overlying said backing on each side of said opening, the thickness of said eyelet adjacent said opening being approximately twice the thickness of said foil and backing.

3,882,265

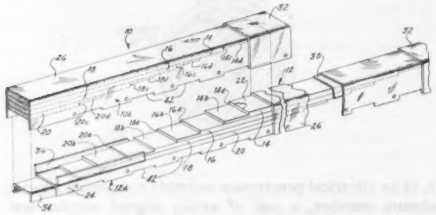
ELECTRICAL BUSWAY WITH IMPROVED JOINT CONSTRUCTION

Frank C. Johnston, Trumbull, and Werner A. Krause, Plantsville, both of Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed May 3, 1974, Ser. No. 466,533

Int. Cl. H01r *5/02;* **H02g** *15/08*

U.S. Cl. 174—88 B **12 Claims**



1. Electrical busway comprising, in combination:

A. plural busway sections, each including

1. a plurality of flat, elongated busbars arranged in stacked relation, corresponding one ends of said busbars formed with scarf lap joint terminations arrayed in longitudinally staggered relation and corresponding other ends of said busbars formed with complementary scarf lap joint terminations likewise arrayed in longitudinally staggered relation,

2. insulation insulating said busbars one from the other, said busbar terminations being devoid of said insulation, and

3. a housing enclosing said stacked busbars along the mid lengths thereof intermediate said busbar terminations,

4. said busway sections aligned in appropriate end-to-end relation with said scarf lap joint terminations of corresponding ones of said busbars in said aligned sections mating to effectuate electrical connections therebetween; and

B. means maintaining said busbar electrical connections between said aligned busway sections.

3,882,266

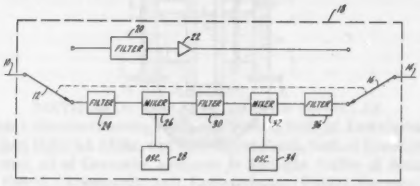
APPARATUS FOR CONVERTING SELECTED CHANNELS

Eugene C. Walding, Arlington Heights, Ill., assignor to Oak Industries, Inc., Sycamore, Ill.

Filed Jan. 11, 1973, Ser. No. 322,852

Int. Cl. H04n *1/44*

U.S. Cl. 178—5.1 **7 Claims**



7. A cable TV converter including an input band pass filter tuned to pass a plurality of contiguous TV channels, a first mixer connected to said filter, and a first oscillator connected to said first mixer,

an intermediate band pass filter connected to the output of said first mixer, said intermediate filter having generally the same band width as said first filter, a second mixer connected to the output of said intermediate filter and a second oscillator connected to said second mixer, and an output band pass filter connected to said second mixer and having a band width the same as said input and intermediate band pass filters,

one of said oscillators having a frequency such that less than all of said plurality of TV channels present at the output of its associated mixer are passed by the following band pass filter.

3,882,267

VIDEO PLAYBACK SYSTEM TRACKING ARM AND PICKUP ASSEMBLY

Marvin Allan Leedom, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1972, Ser. No. 314,976

Claims priority, application United Kingdom, Apr. 19, 1972, 18154/72

Int. Cl. G11b *11/06;* **H04n** *5/76*

U.S. Cl. 178—6.6 A **12 Claims**

1. In a video playback system for use with a video disc record having geometrical variations in a spiral groove on a major surface of said disc record, said video playback system employing signal processing circuitry subject to energizing oscillations, the combination comprising:

a tracking stylus for engaging said disc record spiral groove, said tracking stylus including an electrode for signal transfer as said disc record is rotated;

means for electrically connecting said stylus electrode to said signal processing circuitry;

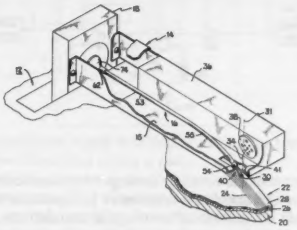
means for shield said signal processing circuitry in order to limit radiation of said energizing oscillations, said shielding means comprising a conductive housing for said signal

processing circuitry having a bottom surface subject to positioning adjacent said disc record during playback;

an elongated tracking arm yieldably supported at one end within said conductive housing and subject to rotational motion, as well as translatory motion in a direction substantially parallel to said housing bottom surface, during record playback; and

support means for said tracking stylus at the end of said tracking arm remote from said one end for supporting said tracking stylus in signal transfer relation with said disc record when said tracking stylus engages said disc record;

wherein said housing has an opening in said bottom surface through which said remote end of said tracking arm pro-



trudes during record playback, and through which radiation of said energizing oscillations may occur; said opening being dimensioned to accommodate said rotational and translatory motions of said tracking arm without engagement between said remote end and said housing; and wherein said tracking arm includes a first straight portion, extending from said one end in substantially parallel relationship with said housing bottom surface during playback, and a further portion adjacent said first portion and curved toward said opening, whereby the opening area requirements requisite for said motion accommodation are reduced relative to the opening area requirements associated with such motion accomodation for a tracking arm of straight configuration between supported end and remote end.

3,882,268

APPARATUS FOR SURVEYING PAVED SURFACE

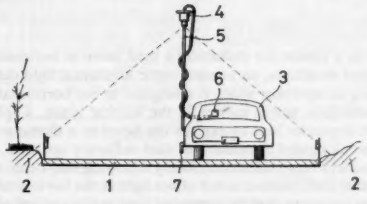
Yukio Ogawa, 7-3, Iwakura Hanazono-cho, Kyoto, and Haruo Miki, c/o Nikon Raina Ishikawadai-ryo, 22-4, 3-chome, Higashiyukigaya, Tokyo, both of Japan

Filed July 2, 1973, Ser. No. 375,860

Claims priority, application Japan, July 3, 1972, 47-59555; July 3, 1972, 47-59556

Int. Cl. H04n *5/84*

U.S. Cl. 178—6 **5 Claims**



1. An apparatus for surveying a paved surface having marginal edges separating the paved surface from the bordering unpaved surface, said apparatus comprising a vehicle, a television camera on said vehicle for viewing the vehicle and the paved and unpaved surfaces, a television receiver for receiving a signal from the camera and includng an image screen on which an image of the vehicle, the paved surface inclusive of its marginal edges, and the unpaved surface is received, a scale on said screen including a central mark and two lateral marks, paint applicator means on said vehicle, the arrangement of said vehicle, camera and marks being such that said marginal edges are aligned with said lateral marks and said applicator means with said central mark, and automatic control means operatively associated with said screen for detecting misalignment of the lateral marks and said marginal edges for correction of such misalignment and including photoelectric sensors adjacent said lateral marks for detecting shifting of the marginal edges relative to said lateral marks due to differences in brightness between the paved and unpaved surfaces.

3,882,269

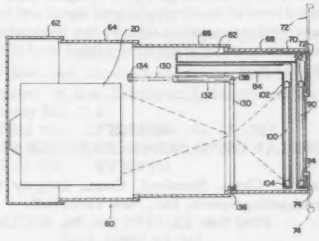
APPARATUS, SYSTEM AND METHOD OF STORING A STATIC IMAGE DISPLAYED ON A TELEVISION TUBE

William R. Niehaus, Cincinnati, Ohio, assignor to The E. W. Scripps Company, Cincinnati, Ohio

Filed May 11, 1973, Ser. No. 359,344

Int. Cl. G11b *31/00*; **G11c** *11/42*

U.S. Cl. 178—6.6 R **16 Claims**



12. A cable television system for storing for subsequent visual display a static image onto a generally flat plate formed from a layer of ceramic material capable of forming a visually displayable image when concurrently exposed to an electromagnetic field and a light image, said system comprising:

a. means for positioning said plate in a position exposed to the image surface of a television tube receiving a static image from a cable television network;

b. means for exposing said flat plate to a generally uniform light source while concurrently subjected to an electromagnetic field;

c. means for creating a selected image on said image surface for at least a given time;

d. means for subjecting said flat plate to an electro-magnetic field while exposed to said selected image;

e. means for requesting a particular selected image;

f. means responsive to said requesting means for displaying said requested selected image on said image surface; and,

g. means for allowing removal of said plate from its exposed position whereby said selected image may be viewed independent of said television tube.

3,882,270

IMAGE TRANSMISSION SYSTEM

Mutsuo Ogawa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 31, 1973, Ser. No. 365,479

Claims priority, application Japan, June 7, 1972, 47-56755

Int. Cl. H04n *1/04*, *1/40*

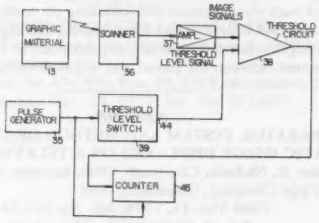
U.S. Cl. 178—7.1 **10 Claims**

1. An image transmission system comprising

means for scanning an image at a repeating plurality of sensitivity levels to generate a sequence of image signals, each image signal corresponding to a scan at a single one of said sensitivity levels;

means for generating a threshold level signal comprising a repeating plurality of threshold levels in timed relationship with each of said image signals; and

means for comparing each image signal with said threshold level signal to generate a first transmission signal when



the level of the image signal is higher than the time related level of the threshold level signal and for generating a second transmission signal when the level of the image signal is lower than the time related level of the threshold level signal.

3,882,271

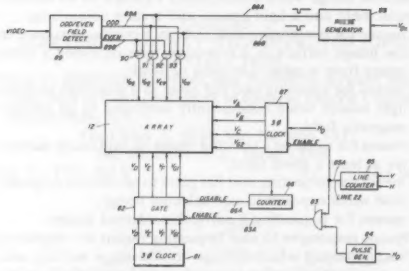
DISPLAY USING ARRAY OF CHARGE STORAGE DEVICES

William E. Glenn, Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Nov. 13, 1973, Ser. No. 415,334

Int. Cl. H04n *3/14*

U.S. Cl. 178—7.3 D **20 Claims**



1. Apparatus for receiving image-representative fields of electronic video information and displaying the images, comprising:

a semiconductor substrate;

an array of semiconductor devices formed in a surface of said substrate, each of said devices being capable of receiving an element of video information as represented by stored charge;

means for sampling said video signal and for temporarily storing elemental samples thereof in said semiconductor devices;

a layer of electrically deformable material disposed on said substrate; and

optical means for converting deformations of said deformable material into an image.

3,882,272

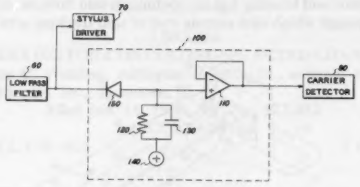
CARRIER DETECTOR

Roger F. Norian, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1973, Ser. No. 427,157

Int. Cl. H04b *1/16*

U.S. Cl. 178—7.3 R **2 Claims**



1. In a facsimile receiver arranged for connection to a communication channel and responsive to signals on said channel to provide a facsimile of an original scanned document, said receiver including carrier detector means responsive to the average level of the signals on said channel for generating a shut-down signal for the inactivation of said receiver when said average level falls below a predetermined value, the improvement comprising

negative peak detector means connected to the input of said carrier detector means and responsive to fluctuations of the level of signals on said channel for maintaining the level at the input to said carrier detector means at substantially the negative peaks of said fluctuations.

3,882,273

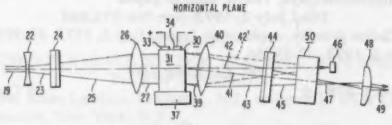
OPTICAL BEAM SCANNING SYSTEM

Joseph Dale Knox, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,177

Int. Cl. H04n *3/10*

U.S. Cl. 178—7.6 **10 Claims**

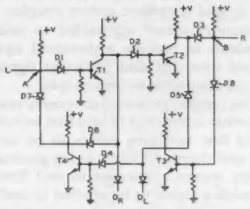


1. In a system for deflecting a light beam in horizontal and vertical directions, an acousto-optic horizontal light deflector having an aperture which is elongated in the horizontal plane of deflection and is narrow in the vertical plane, a spherical beam expander lens to expand the beam to a diameter equal to the elongated dimension of said deflector aperture, a first cylindrical lens positioned closely following said beam expander lens and oriented to not affect light in the horizontal plane but to converge slightly-expanded light in the vertical plane to the narrow dimension of the deflector aperture, a spherical collimator lens to direct the horizontally expanded beam in parallel rays through said acousto-optic deflector, and a reverse telescope, including a spherical converging lens and a second cylindrical lens spaced from said converging lens, to focus the light from said deflector to a point in a utilization plane.

3,882,274
BIDIRECTIONAL DIGITAL AMPLIFIER

William E. Vice; Arthur J. Brodersen, and Gerald J. Lipovski, all of Gainesville, Fla., assignors to Board of Regents, State of Florida, Tallahassee, Fla.

Filed Feb. 28, 1974, Ser. No. 446,797
Int. Cl. H04l *25/24*
U.S. Cl. 178—70 TS **9 Claims**



1. A bi-directional signal translating device for transmitting signals in two directions along a path,

said translating means including first amplifier means for propagating in a first direction a signal applied to its input and a second amplifier for propagating in the second direction a signal applied to its input,

means responsive to a signal applied to the input of each one of said amplifier means for blocking propagating of a signal applied to the input of the other one of said amplifier means,

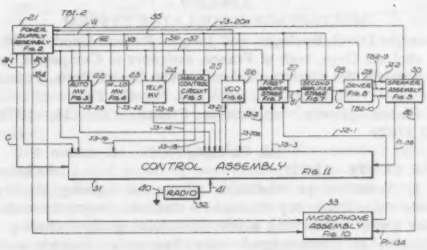
means for connecting in common the input of said first amplifier means and the output of said second amplifier means including a first unidirectional conducting device, means for connecting in common the input of said second amplifier means and the output of said first amplifier means including a second unidirectional conducting device,

and means for selectively applying delimiting control signs at preselected times to either one amplifier means or simultaneously to both amplifier means, for blocking propagation of input signals therethrough.

3,882,275
SOUND COMMUNICATION SYSTEM

Gordon S. Carroll, Costa Mesa, Calif., assignor to International Telephone & Telegraph Corporation

Filed Aug. 2, 1973, Ser. No. 384,889
Int. Cl. G08b *3/10*
U.S. Cl. 179—1 R **19 Claims**

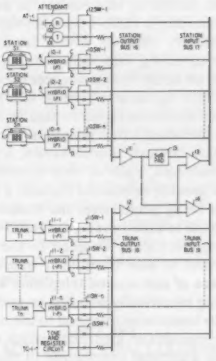


1. A multipurpose sound communication system comprising: first and second oscillators having first and second output leads, respectively, said first and second oscillators producing respective first and second periodic output signals on said first and second leads thereof which have magnitudes that are first and second different predetermined functions of time, respectively; first means having an input lead, said first means being constructed to broadcast audible sound when at least one signal of an audio frequency is impressed upon said first means input lead; and a selectively operable switch having at least one pole and at least first and second contacts; and second means connecting said switch pole to said first means input lead, said first and second output leads of said respective first and second oscillators being respectively connected to said first and second switch contacts, said switch pole being movable to a first position in which said pole engages the said first switch contact without engaging the said second switch contact, and to a second position in which said pole engages the said second switch contact without engaging the said first switch contact, said third oscillator third output signal being on audio frequency signal, said second means including a third oscillator having a third output lead and a control input, said control input being connected from said switch pole, said third oscillator being constructed to produce a third periodic audio output signal on said third output lead of a frequency that is a third predetermined function of and variable with the magnitude of a signal impressed upon said control input thereto, said third oscillator output lead being connected to said first means input lead.

3,882,276
CONFERENCING SYSTEM UTILIZING OPPOSITELY PHASED HYBRIDS

Alexander Feiner, and Dennis Bryan James, both of Rumson, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 22, 1974, Ser. No. 453,705
Int. Cl. H04m *3/56*
U.S. Cl. 179—1 CN **7 Claims**



1. A conferencing system for interconnecting a plurality of 2-wire communication devices, said system comprising:

a plurality of hybrids, each hybrid adapted for converting from 2-wire to 4-wire operation, said 4-wire portion of said hybrids including an output bus and an input bus;

means for interconnecting said output bus of each hybrid and for interconnecting said input bus of each of said hybrids, said interconnecting means including a summation means for communicating signals from said output bus to said input bus,

said hybrids arranged in groups, a first group connected to certain ones of said communication devices and a second group connected to other ones of said communication devices,

said first group of hybrids having means for establishing a signal having a first polarity with respect to any reflected transmission signals,

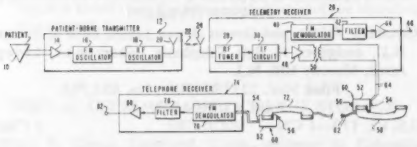
said second group of hybrids having means for establishing a signal having a second polarity with respect to any reflected transmission signals; and

means for enabling said interconnecting means of selected ones of said first group of hybrids and of selected ones of said second group of hybrids so that a conference connection is possible between said communication devices associated with said interconnected hybrids whereby the polarity differences of the reflected signals of said first group of hybrids and said second group of hybrids act to reduce the overall reflected signal.

3,882,277
ELECTROCARDIOGRAPHIC TELEMETRY AND TELEPHONE TRANSMISSION LINK SYSTEM

Donald DePedro, Millis, and Robert Cannon, Waltham, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 20, 1972, Ser. No. 246,053
Int. Cl. H04h *11/06*
U.S. Cl. 179—2 DP **6 Claims**



1. A system for transmitting an EKG signal from an ambulatory patient to a remote monitor comprising a portable patient-borne unit carried by said patient for detecting said EKG signal and transmitting a radio-frequency signal representative thereof, a telemetry receiver within range of said patient-borne unit for detecting said radio-frequency signal and for converting it to an audio-frequency electrical signal representative of said EKG signal, a telephone link for extending said audio-frequency electrical signal to said remote monitor, said telephone link including a first telephone, a second telephone, a communication channel therebetween, a pair of electrical-acoustical transducers, each of said transducers including a housing with a speaker contained therein, a first of said transducer housings being placed over the mouthpiece of said first telephone with the telemetry receiver audio-frequency electrical signal being electrically coupled to the respective transducer, the second of said transducer housings being placed over the earpiece of said second telephone with the respective transducer being electrically coupled to said remote monitor, and wherein the transducer attached to the mouthpiece of said first telephone includes an electrical switch which when operated breaks the electrical connection of the transducer, said patient-borne unit further including electrode leads for connection to said patient for detecting an EKG signal, and means for applying the radio-frequency signal to said leads so that said leads further function as an antenna for transmitting said signal.

3,882,278
INTERFACE DEVICE FOR USE WITH AN ALARM SYSTEM AND A TELEPHONE SYSTEM

Edward T. Coll, Philadelphia, Pa., assignor to Martha H. Egly and Michael J. Manchester, Philadelphia, Pa.

Filed July 16, 1973, Ser. No. 379,610
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 R **8 Claims**

1. An interface device to be used to connect an alarm system to a telephone system coupler comprising in combination a first source of power adapted to be activated during predetermined hours,

means connecting said first source of power to said telephone system coupler to provide power thereto,

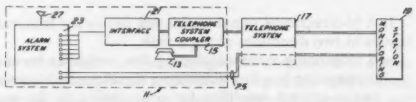
first signal switching means having first and second terminals,

first circuitry means connecting said first and second terminals to said telephone system coupler to activate said first switching means in response to a particular signal being transmitted to said telephone system coupler,

first timing circuitry means connected to said first and second terminals to provide a threshold signal after a predetermined time that said particular signal has been applied to said telephone system coupler,

second switching means connected to receive said threshold signal and further connected to said first switching means to cause said first switching means to be turned off in response to said threshold signal being generated,

second circuitry means connected to said first switching means to enable a signal to be applied to said telephone system coupler which in turn causes it to seize a telephone line connected thereto in response to said first signal switching means being switched,



third circuitry means connected to said first signal switching means and to said alarm system as well as to said telephone system coupler to enable audio signals to be transmitted from said alarm system through said first signal switching means, through said telephone system coupler to said seized telephone line,

fourth circuitry means connected to said first signal switching means to provide control signals through said first signal switching means to said telephone system coupler, and

fifth circuitry means including second timing circuitry means connected to both said first circuitry means and said fourth circuitry means whereby at least one of said control signals is connected to disconnect said second timing circuitry means while said first signal switching means are activated and whereby said second timing circuitry means is connected to disenable said first circuitry means from passing said particular signal after a given period of time during which said second timing circuitry is activated.

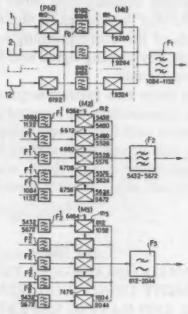
3,882,279
MULTI-STAGE MODULATOR SYSTEM

Georges Duval, Boulogne, and Jacques Renaud-Goud, St. Michel sur Orge, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 24, 1973, Ser. No. 409,293
Claims priority, application France, Oct. 24, 1972, 72.37679
Int. Cl. H04j *1/06*
U.S. Cl. 179—15 FD **6 Claims**

1. A multi-stage modulator system for forming, starting from voice frequency channels, a standard frequency multiplex group, comprising a first modulator group including a plurality of premodulated voice frequency channels each having a first modulator receiving respective input signals and respective modulation signals and a first filter connected directly to the outputs of said first modulators in common, a second modulator group including a plurality of second modulators each receiving the output of said first filter and a respective modulation signal and a second filter connected directly to the outputs of said second modulators in common, and a third modulator group including a plurality of third modula-

tors each receiving the output of said second filter and a respective modulator signal and a third filter connected di-



rectly to the outputs of said third modulators in common, each of the modulators of each modulator group supplying a single modulation sideband within a given frequency band.

3,882,280

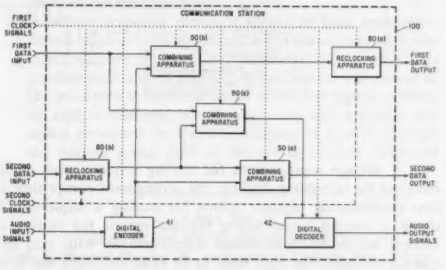
METHOD AND APPARATUS FOR COMBINING DIGITIZED INFORMATION

Michel M. Goutmann, Fort Washington, Pa., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Dec. 19, 1973, Ser. No. 426,176

Int. Cl. H04j *3/08*

U.S. Cl. 179—15 AL **20 Claims**



1. A plurality of communication stations for permitting simultaneous exchange of vocal information between said communication stations wherein each of said stations comprises:

first means for combining first digitally-encoded signals from a first group of said communication stations with second digitally encoded signals from a second group of said communication stations, output signals from said first combining means providing data to said station from said first and second group of communication stations;

second means for combining said first signals with digitally encoded local signals, output signals from said second combining means for distribution to said second group of said communication stations; and

third means for combining said second signals with said local signals, output signals from said third combining means for distribution to said first group of said communication stations.

3,882,281

CONTROL AND SUPERVISION OF TELECOMMUNICATIONS SWITCHING NETWORKS

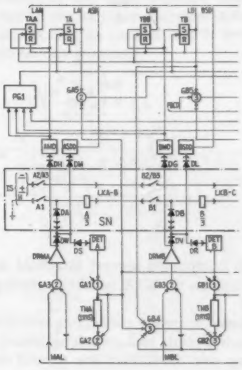
Brian Grundy, Ashton-in-Makerfield, and Robert Toy, Fairfield, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed May 31, 1973, Ser. No. 365,645

Claims priority, application United Kingdom, June 6, 1972, 26302/72

Int. Cl. H04m *3/42*

U.S. Cl. 179—18 E **11 Claims**



1. A switching network, comprising a succession of link-connected stages each having a plurality of matrix switches formed by crosspoint relays, with control equipment, for effecting the setting-up and release of self-holding connections between any inlet and an outlet of the network and characterised in that said equipment has an incoming multi-conductor signalling-path for the reception of individual instruction messages including messages demanding the setting-up and release of specific network connections, an outgoing multi-conductor signalling-path for the transmission of status messages by said equipment, and marking arrangements which are operable either by a setting-up instruction message to selectively mark the outlet and all other salient points of the specified connection with potentials suitable for the establishment of that connection, or by a release instruction message to selectively and exclusively mark the outlet of a specified established connection with a potential such as to effect release of that connection.

3,882,282

SYSTEM FOR DETECTING LOOPING OF A SUBSCRIBER'S TELEPHONE LINE

Jean Picandet, Paris, France, assignor to Jeumont-Schneider, Puteaux, France

Filed July 18, 1973, Ser. No. 380,393

Claims priority, application France, July 20, 1972, 72.26123

Int. Cl. H04m *3/02*

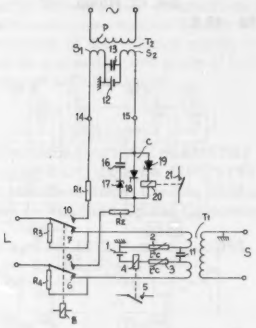
U.S. Cl. 179—18 HB **4 Claims**

1. A circuit for terminating the application of ringing pulses to a subscriber line when an off-hook condition occurs either during ringing periods or silent periods between ringing pulses comprising:

a subscriber speech circuit having a source of D.C. potential and a transformer,

first threshold detector means connected in series with said source of D.C. potential and said transformer for detecting an off-hook condition during a silent period,

an A.C. source for providing said ringing pulses,
a D.C. source connected in series with said A.C. source,
a detector circuit connected in series with said A.C. and D.C. sources,
said detector circuit having three parallel paths comprising:
a first path comprising a capacitor,
a second path comprising a diode connected in opposition to said D.C. source, and



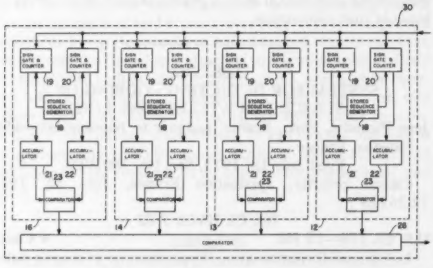
a third path comprising second threshold detector means for detecting an off-hook condition during a ringing period, and
switching means normally connecting said subscriber line to said speech circuit, said switching means operative for connecting said subscriber line to said detector circuit during ringing periods,
whereby activation of either said first and second threshold detector means terminates the operation of said switching means thereby terminating said ringing pulses on said subscriber line.

3,882,283

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF SIGNAL COMPONENTS OF PREDETERMINED FREQUENCY IN A MULTI-FREQUENCY SIGNAL

Alexander David Proudfoot, Oxford, England, assignor to The Commonwealth of Australia, Melbourne, Australia

Filed Aug. 13, 1973, Ser. No. 387,855
Claims priority, application Australia, Aug. 10, 1972, 24/72
Int. Cl. H04m *1/50*
U.S. Cl. 179—84 VF **17 Claims**



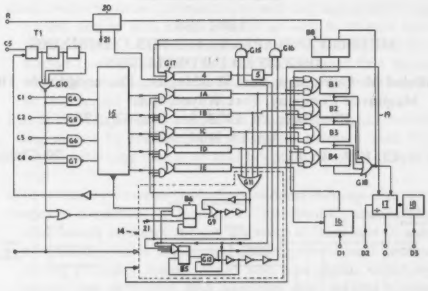
1. A method of determining whether a particular frequency component is present in a first sequence of pulse code modulated signals, the signals representing instantaneous time spaced values of a periodically varying signal of substantially constant amplitude, the method comprising;
generating from a stored sequence generator second and third sequences of digitally encoded signals respectively representing the instantaneous values, at time spacings corresponding to the time spacing of said values of said periodically varying signal, of separate ones of two test signals of said particular frequency, these test signals being of substantially constant amplitude and of substantially square-wave form but displaced relative to each other by a phase displacement other than 0 and π;
deriving two further sequences of signals representing the multiplicands of the corresponding instantaneous values of the periodically varying signal and the respective phase displaced test signals;
deriving, from these two further sequences of signals, two signals, one representing the sums of the multiplicands of each respective said further sequence of signals; and
deriving, from said signals representing the sums of multiplicands, an indication signal which, when said component is present, is indicative of such presence.

3,882,284

DIAL SIGNAL STORAGE AND TRANSMISSION ARRANGEMENT USING DUAL RECIRCULATING REGISTERS AND HAVING REPEAT CAPABILITY

John Charles Munday, Fife, Scotland, assignor to General Instrument Corporation, Clifton, N.J.

Filed Mar. 20, 1974, Ser. No. 452,685
Int. Cl. H04m *1/42*
U.S. Cl. 179—90 B **10 Claims**

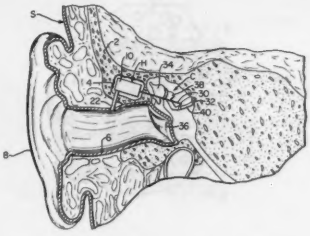


1. A storage arrangement for storing sequences of digits required for telephone dialling, the arrangment comprising: a first recirculating register means for storing a sequence of digits; a second recirculating register means for storing a marker bit to be recirculated synchronously with said sequence to mark the digit next to be read out from the first register means; an excess bit position of the second register means and which provides for the second register means a bit position in excess of the number of digit positions in the first register means; gate means having a first mode to cause the excess bit position to be bypassed so that the marker bit will circulate in alignment with a digit in the first register means and having a second mode to cause the excess bit position to be utilised to displace the marker bit rearwardly in relation to a sequence of digits in the first register means; and control means coupled to the register means and the gate means for controlling the gate means, in dependence upon marker bit position and upon the digit positions, (a) to position the marker bit to mark the first digit to be read out, (b) to set the gate means to the second mode to displace the marker bit by one position rearwardly on read-out of a digit to mark the next digit to be read-out, and (c), subsequent to read-out of all the digits, to set the gate means to the second mode to repeatedly offset the marker bit until it again marks the first digit of the sequence.

3,882,285
IMPLANTABLE HEARING AID AND METHOD OF IMPROVING HEARING

James A. Nunley, and Jeremy A. Agnew, both of Colorado Springs, Colo., assignors to The Vicon Instrument Company, Colorado Springs, Colo.

Filed Oct. 9, 1973, Ser. No. 404,339
Int. Cl. H04r *25/02*
U.S. Cl. 179—107 E **10 Claims**



1. A self-contained implantable hearing device for positioning in a hollowed-out portion of the skull adjacent to the ear canal to provide a sound path parallel to the normal sound path to improve hearing, said unit comprising:

transducer means positionable adjacent the ear canal for receiving audio signals entering the ear canal and converting them to electrical signals;

means for connecting said transducer means with the ear canal for transmission of the audio signal from the ear canal to said transducer means for transmission along a path parallel to the ear canal;

amplifier means coupled to said transducer means adjacent the ear canal for amplifying the electrical signal produced by said transducer means along said parallel path;

transmitter means coupled to said amplifier means adjacent the ear canal for converting the electrical signal to a mechanical response; and

mechanical response means coupled to said transmitter means adjacent the ear canal and connectable to a mechanical drive structure within the ear to complete said parallel path and to provide a mechanical movement of the structure in response to an acoustical signal received by said transducer, which augments and supports any signal produced by the transmission of sounds through the normal sound path of the ear to provide improved hearing.

3,882,286
TELEPHONE SWITCHING SYSTEM

Virgle E. Porter, Steger, Ill., assignor to Amtron, Inc., Midlothian, Ill.

Filed May 8, 1973, Ser. No. 358,465
Int. Cl. H04q *1/52*
U.S. Cl. 179—18 GF **39 Claims**

1. In a telephone switching system having a crosspoint matrix of horizontal and vertical terminal dimensions N by M, respectively, with the matrix crosspoint at the intersection of respective horizontal and vertical terminal pairs being adapted for effecting an electrical interconnection of said respective terminal pairs in response to coincident signal markings thereon and further having N termination circuits and M normally idle link circuits coupled to individual ones of said horizontal and vertical terminals, respectively, of said matrix, the combination comprising:

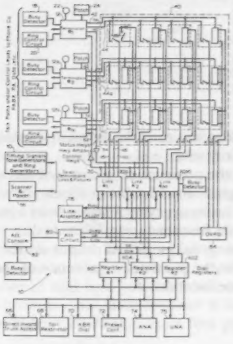
a plurality of register means associated with said link circuits;

scanner means for signal markings the horizontal terminal of a first predetermined member of said N termination circuits;

allotter means for enabling an idle one of said M link circuits to signal mark its associated vertical matrix terminal and for completing an electrical connection to said horizontal terminal of said first predetermined member of said N termination circuits;

means responsive to said link circuit signal mark for electrically connecting one of said register means to selected link circuit and for supplying a dial tone to said predetermined member of said N termination circuits to enable said predetermined member of said N termination circuits to dial, and whereby said connected register means is responsive to said dialing;

a first control circuit means connecting each of said M link circuits to each of said N termination circuits, wherein said first control circuit means supplies individual identification data relating to each of said N termination circuits to said M link circuits;



a second control means connecting each of said N termination circuits to each of said M link circuits whereby said connected register means energizes said second control circuit means associated with a second member of said predetermined N termination circuits in response to said dialing thereby signal marking the horizontal terminal of said second predetermined member of said N termination circuits, whereby said second predetermined member of said N termination circuits is connected to said first predetermined member of said N termination circuits through said previously connected vertical matrix terminal; and

conference circuit means associated with said register means for connecting a preselected number of said termination circuits together along a single vertical matrix terminal.

3,882,287
METHOD AND APPARATUS FOR DETECTING FAULTS AND LOCATING CONDUCTORS IN MULTI-CONDUCTOR CABLES

James F. Simmonds, Sherman Oaks, Calif., assignor to Perkins Research & Mfg. Co., Canoga Park, Calif.

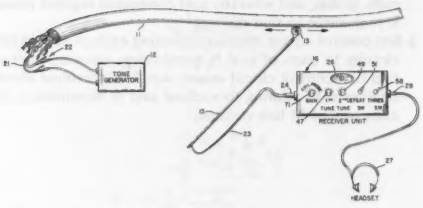
Filed Apr. 20, 1973, Ser. No. 353,210
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 A **7 Claims**

1. A method for detecting and locating faults and/or identifying conductors in a multiconductor cable comprising the steps of:

connecting one of a plurality of tone generators all having a known nominal frequency but wherein the precise frequency of any given such generator varies from said

nominal frequency and is thus unknown to one or more conductors of the cable at a first location thereon;

temporarily coupling a tunable frequency amplifier having a manual adjustment to said tone generator or to a point adjacent the connection of said generator to said cable; tuning the tunable amplifier by means of said manual adjustment to the precise frequency emitted by said generator;



decoupling the tunable frequency amplifier from said first location; and

sensing the presence or absence of the applied tone generator signal on said cable at a location remote from said first location by applying a signal from a pick-up means to said tunable frequency amplifier; and

monitoring the amplified output available from said amplifier for the presence or absence of the tone signal at said remote location.

3,882,288

CABLE SYSTEM FOR THE TRANSMISSION OF ELECTRIC ENERGY FROM A STATIONARY ELECTRIC PLANT TO A TRUCK OR ANOTHER STEERABLE VEHICLE DRIVING FREELY WITHIN THE RANGE OF THE CABLE SYSTEM

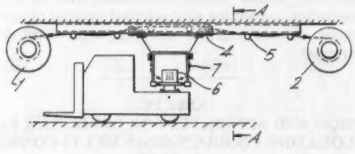
Rolf Bjorn Rasmussen, Krokliveien 2 b, N-Oslo 5, Norway

Filed Nov. 28, 1973, Ser. No. 420,188

Claims priority, application Norway, Aug. 24, 1973, 3358/73

Int. Cl. H02g *11/00*

U.S. Cl. 191—2 **7 Claims**



1. In combination: a steerable vehicle, a slip ring contact on said vehicle, said contact having a substantially vertical axis, a guide bow associated with said contact, said guide bow being tiltable about a generally horizontal axis; a rectilinear track disposed above said vehicle; a guide carriage movable along said track, two flexible cable elements guided by said carriage and secured to said guide bow, a least one of said cable elements being a supply cable and contacting said slip ring and means for applying tension to said cables.

3,882,289

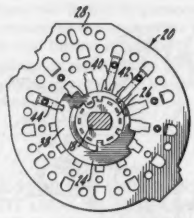
BINARY CODED ROTARY WAFER TYPE SWITCH ASSEMBLY

Eugene C. Walding, Arlington Heights, and John G. Cummings, Cary, both of Ill., assignors to Oak Industries, Inc., Crystal Lake, Ill.

Filed Feb. 28, 1972, Ser. No. 229,712

Int. Cl. H01h *19/58*

U.S. Cl. 200—11 D **2 Claims**



1. In a television receiving means, a rotary channel selector switch having a shaft, rotor means mounted on said shaft, a stator positioned about said rotor, said stator having five of output lines and only one input line, said selector switch having at least **26** finite positions, said rotor means and stator having cooperative contact areas such that the input line is connected to different combinations of said output lines for each position of the channel selector switch shaft and such that there is a change in the condition of only one output line each time the switch shaft is moved from one position to an adjacent position, the condition of the output lines providing a coded indication of switch position.

3,882,290

MULTIPOLE LIMIT SWITCH WITH AN ANGULARLY RESETTABLE OPERATING HEAD

Eugene F. Duncan, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed July 12, 1973, Ser. No. 378,409

Int. Cl. H01h *3/16*

U.S. Cl. 200—47 **8 Claims**

1. A multipole limit switch comprising:

a self-enclosed switch portion having an open end;

a self-enclosed operating head having a mating end secured to said open end to close the latter and provide a limit switch allowing detachment of said operating head without any parts falling out, and rotation and repositioning of said operating head at a different angle on said open end of said switch portion without changing switch operation or function or requiring relocation of any operating parts;

said switch portion comprising:

a housing;

stationary contact means mounted in said housing;

movable contact means mounted in said housing;

contact actuator means including first and second plunger members to cause movement of said movable contact means into selected positions of actuation with said stationary contact means;

guiding means for said plunger members allowing low-friction movement thereof relative to one another; and a pair of pivoted levers at said open end of said switch portion for actuating the respective plungers, the first one of said levers having an engagable portion at the center of said open end, and the second lever having an engagable portion radially spaced from said center;

and said operating head comprising:

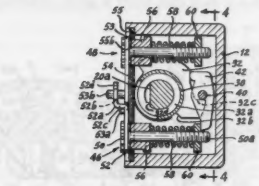
a housing;

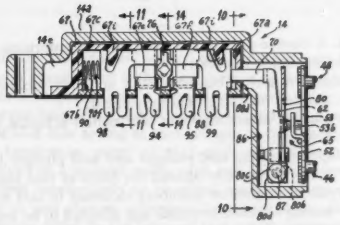
an external operating arm mounted on said housing and adapted to be moved into at least two positions to operate said switch;

first and second push plate means;

means for transmitting operating motion from said external operating arm selectively to said first and second push plate means;

said first push plate means having an actuator operably located generally centrally of said mating end to cause actuation of said first pivoted lever for all





angular mounting positions of said operating head in response to movement of said operating arm to one of said positions;

and said second push plate means having an actuator operably located generally concentrically around said first push plate actuator at the radius of said engagable portion of said second pivoted lever to cause actuation of said second pivoted lever for all angular mounting positions of said operating head in response to movement of said operating arm to another of said positions.

3,882,291

MECHANICAL INTERLOCK MECHANISM FOR AN ELECTRICAL CABINET

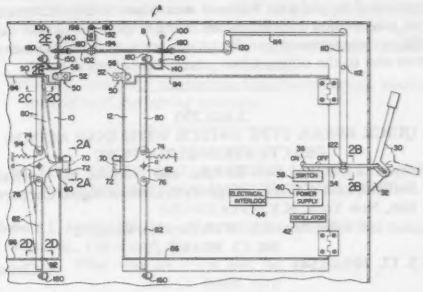
Joseph W. Chiboroski, Brooklyn Heights, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Feb. 14, 1974, Ser. No. 442,688

Int. Cl. H01h *9/20*; **E05b** *65/46*

U.S. Cl. 200—50 A **16 Claims**

1. A mechanical interlock for a cabinet surrounding an electrical component and having a switch control member movable between a first position allowing energization of said component and a second position preventing energization of said component, at least one door movable between a first closed position and a second opened position, and a door latch element movable between a first position latching said door to said cabinet when said door is in said closed first position and a second position unlatching said door from said cabinet and, thus, allowing movement of said door with respect to said cabinet, said mechanical interlock comprising: an actuation element; means for connecting said actuation element to said switch control member for movement between a first position when said switch control member is in its first position and a second position when said switch control member is in its second position; a latch member on said cabinet, said latch member being mounted on said cabinet for movement between a first position and a second position and having a first locking abutment facing one direction; means connecting said latch member with said actuation element for urging said latch member toward its first position when said actuation element is in its first position and for moving said latch member into its second position when said actuation element is in its second position; spring means between said actuation element and said latch member for biasing said latch member toward its first position and allowing forced movement of said latch



member toward its second position while said actuation element is in its first position; a keeper element with a second locking abutment mounted onto said door and movable into a first position by movement of said door latch element into its first latching position and movable into a second position by movement of said door latch element into its unlatching position; means for aligning said keeper element with said latch member so that said locking abutments coact to lock said door latch member in said first position when said door is in said first closed position, said latch member is in its said first position and said keeper element is in its first position.

3,882,292

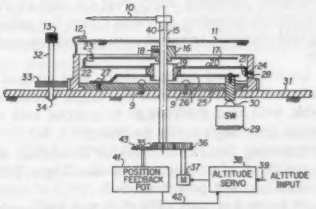
INDICATOR TYPE SWITCH ASSEMBLY WITH PERIPHERAL CAM FOLLOWER MOTION TRANSFER SWITCH ACTUATION MEANS

Glade M. Stockwell, and Benjamin B. Biderman, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 428,167

Int. Cl. G01d *13/26*

U.S. Cl. 200—56 R **8 Claims**



1. A switching mechanism responsive to rotation of a rotatable member from one preselected rotational segment to an adjacent complementary segment thereof comprising: means for mounting said rotatable member for rotation about an axis normal to a mounting base member, an arcuate plate member, means for mounting said arcuate plate member for rotation about the axis of said rotatable member and in concert therewith, camming surface means carried by said arcuate plate member at a point on the circumference thereof correspond-

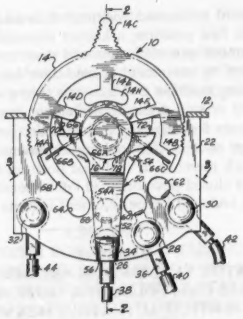
ing to a reference point on said rotatable member, cam follower means being selectively positionable about the circumference of and in spring loaded engagement with said arcuate plate member, said cam follower means, when operably engaged with said camming surface means, effecting a transfer of engagement of said cam follower means from one planar surface of said arcuate plate member to the opposite planar surface thereof to effect a predetermined translation of said cam follower means transverse the plane defined by said arcuate plate member, switching means fixed-mounted with respect to said mounting base member, motion transfer means connected to said cam follower means and said switch member, said motion transfer means being responsive to said cam follower engagement transfer to activate said switching means from one to the other of two possible positions thereof.

3,882,293

QUICK BREAK TYPE SWITCH WITH SNAP ACTION DEACTUATION STRUCTURE

Richard J. Naples, New Britain, and Norman H. Newhall, Suffield, both of Conn., assignors to General Signal Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,272
Int. Cl. H01h *5/16*
U.S. Cl. 200—154 **6 Claims**



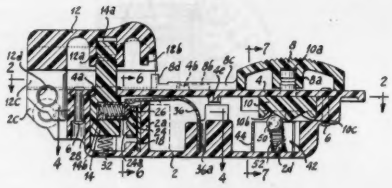
1. An electric switch assembly comprising:
a base plate;
a common electrical terminal on said base plate;
a plurality of spaced, fixed electrical contacts arranged in an arcuate line on said base plate;
a shaft secured to said base plate;
a switch member rotatably supported on said shaft, said switch member including a contact arm for selectively bridging said common terminal with any one of said fixed contacts;
a control knob disposed on said shaft, said control knob being adapted to be actuated by finger pressure and engageable with said shaft so as to control said switch member for selecting contact positions;
means for retaining the switch member in certain of said contact positions after removal of the finger pressure used in selecting such positions;
spring means formed around said shaft and engageable by said control knob such that the spring means is able to shift the contact arm abruptly from certain ones of said fixed contacts to other ones thereof;
means on said base plate for restraining said spring means only when said switch member is being moved to a predetermined one of said contact positions from an adjacent position by application of sufficient pressure to said control knob, such that said switch member will remain in such predetermined position so as to engage the particular fixed contact thereat only so long as said sufficient pressure is being applied, and will return to said adjacent position upon release of the pressure.

3,882,294

TOOL HANDLE SWITCH WITH INTERLOCK

Harold W. Hults, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 27, 1974, Ser. No. 455,383
Int. Cl. H01h *5/10, 13/08*
U.S. Cl. 200—157 **8 Claims**



1. A double-pole tool handle switch comprising:
an insulating housing;
a return spring biased switch actuator mounted to said housing for reciprocal movement;
a plunger extending from said switch actuator within said housing;
a spring biasing said plunger and said plunger being resiliently depressible against the force of said bias spring;
a pair of connector members mounted in said housing and having exposed terminal lugs adapted to be connected to an external circuit;
a movable contact actuator block having a double-incline camming surface comprising opposite inclines meeting at a high point arranged for engagement by said plunger;
double-pole on-off butt contacts having a controlled amount of wipe comprising a pair of movable contacts carried by said actuator block and being pressed against the respective connector members and sliding therealong and remaining in contact therewith throughout the movement of said actuator block, and a pair of stationary contacts mounted in said housing and having flexible cantilever portions extending into overlapping relation to the respective movable contacts and biased to a small inclination toward said movable contacts from a plane substantially perpendicular to the path of movement thereof;
and actuation of said switch actuator causing said plunger to slide up one incline of said camming surface and, after passing over said high point, to cause snap-action movement of said actuator block while said plunger acts on the other incline and said movable contacts remain in sliding contact with said connector members thereby to cause said movable contacts to contact said stationary contacts and to move a small distance further, flexing said stationary contacts against the bias therein to cause a controlled amount of wipe therebetween.

3,882,295

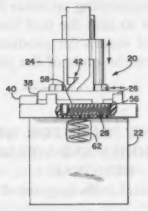
TACTILE FEEDBACK SWITCH MECHANISM

Robert Christen Madland, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 4, 1973, Ser. No. 403,372
Int. Cl. H01h *13/52*
U.S. Cl. 200—159 R **6 Claims**

1. A manually operated electrical switch comprising a switching mechanism, a housing comprising a cavity and first and second pairs of retaining tabs, a plunger depressable along a first axis and comprising a cam, a return spring for said

plunger, a unitary cam follower carrier comprising first and second spaced apart wing members, said first pair of retaining tabs being constructed to overlap said first wing member and said second pair of retaining tabs being constructed to overlap said second wing member, said cam follower carrier being displaceable with respect to said housing along a second axis that is substantially normal to said first axis and comprising a tongue which projects into said housing cavity and a resilient arm having a cam follower thereon, a coiled bias spring positioned in said cavity between said tongue and a wall of said cavity for biasing said cam carrier follower to an initial position and said cam carrier to a first point, said resilient arm being displaceable along a third axis that is substantially normal to both said first axis and second axis with said cam follower being in engagement with a first portion of said cam as said plunger is depressed to a breakaway point, said cam follower carrier being directed along said second axis against the force of said bias spring as said plunger is depressed beyond said breakaway point so that said cam follower is abruptly driven to a second point, said cam follower carrier being returned substantially to its initial position along said second axis as said plunger completes its return to its undepressed position aided by the force of said return spring with said cam follower completing its return to said first point over a second portion of said cam as a result of a deflection of said resilient arm along said third axis.

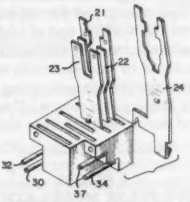


3,882,296

LEAF SPRING SWITCHING MEANS

Peter Keith Townsend, Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 5, 1973, Ser. No. 413,078
Int. Cl. H01h *1/30*
U.S. Cl. 200—246 **16 Claims**



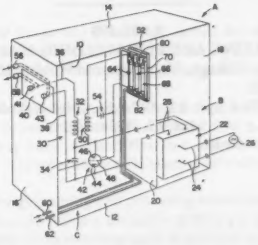
1. A leaf spring type switch comprising:
a plurality of leaf spring contacts having a longitudinal axis; a plurality of lead-in wires;
a base of molded, insulative material comprising a plurality of slots formed therein and positioned in a side-by-side relationship with each other in a stacked manner, and with said slots all opening in substantially the same direction from said base;
each slot lying in a separate plane with said separate planes positioned to intersect a first given plane at parallel lines of intersection;
said base further comprising a plurality of apertures formed therein, each of said apertures being oriented to intersect different ones of said slots;
one of said lead-in wires being inserted in each of said apertures to intersect said different ones of said slots;
one of said leaf spring contacts being retained in each of said slots with its longitudinal axis being substantially perpendicular to said parallel lines of intersection;
at least some of said leaf spring contacts having a notch formed therein, with said notch of each leaf spring contact being positioned to engageably slide over the particular lead-in wire inserted in the aperture which intersects with the slot in which said each leaf spring contact is inserted, to thereby make electrical contact with said particular lead-in wire; and
actuating means for connecting and disconnecting slective ones of said leaf spring contacts.

3,882,297

WATER COOLED GRID RESISTOR ASSEMBLY FOR RADIO FREQUENCY INDUCTION HEATING GENERATOR

Robert J. Avalon, Burton, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed May 28, 1974, Ser. No. 473,382
Int. Cl. H05b *9/00*
U.S. Cl. 219—10.75 **7 Claims**



1. In a radio frequency induction heating generator including oscillator circuit means and cabinet means enclosing said circuit means and wherein said circuit means includes oscillator tube means having a grid resistance means electrically connected with said grid, the improvement comprising: means including casing means supporting said grid resistance means with respect to said cabinet means, said casing means enclosing said grid resistance means in spaced relationship with respect thereto and in sealed relationship with respect to the interior of said cabinet means, and means providng inlet and outlet passageways in said casing means for flowing cooling liquid therethrough in heat transfer relationship with said grid resistance means.

3,882,298

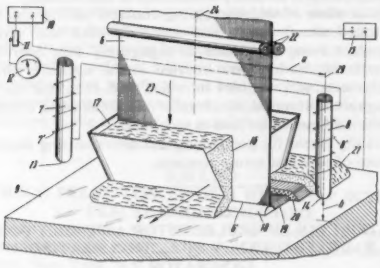
METHOD OF AND APPARATUS FOR THE SUBMERGED ARC SURFACING OF METALLIC WORK PIECES

Franz Neff, and Hermann Ornig, both of Kapfenberg, Austria, assignors to Gebr. Boehler & Co., Vienna, Austria

Filed Apr. 13, 1973, Ser. No. 351,122
Claims priority, application Austria, Apr. 14, 1972, 2218078/72
Int. Cl. B23k *9/08*
U.S. Cl. 219—76 **7 Claims**

1. Apparatus for the submerged arc surfacing of metallic work pieces with metal electrode strips melting in an electric arc while forming welding beads of more tha 75 mm width, comprising a work piece, an electrode strip, means operative to move said electrode strip and work piece relative to each other, a direct current source, means for connecting to oppo-

site poles of said source the electrode strip and the work piece, respectively, electromagnetic means producing a stationary magnetic field and having a pair of end faces of opposite polarity operatively mounted at opposite sides of electrode strip, means for adjusting the intensity of said electromagnetic



means, said end faces of opposite polarity being arranged in the edge zone of the melt-off edge of the strip electrode at equal distances from the center axis of the strip, the electromagnetic means being disposed at equal distances from the surface of the work piece.

3,882,299

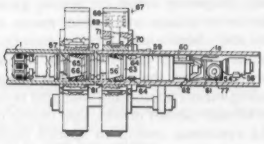
ROTATING ARC PIPE WELDING MACHINE

David Sciaky, Chicago, Ill., assignor to Welding Research, Inc., Chicago, Ill.

Filed Apr. 12, 1974, Ser. No. 460,600

Int. Cl. B23k *9/02*

U.S. Cl. 219—60 R **6 Claims**



1. An apparatus for welding girth joints between the adjacent ends of pipes laid end to end comprising:

a tube approximately equal in length to the longest pipe to

three hydraulic cylinders fastened in tandem to one end of the said tube, each cylinder forming a sealed chamber of annular form coaxial with the longitudinal axis of the said tubing;

a second tube telescoped and slidable within the first tube, one end of said second tube fastened to a piston slidable within the first of said annular chambers and having fastened at its opposite end a means for clamping the said pipe to the said second tube;

a third tube telescoped within the said second tube and fastened at one end to a second piston which is slidable within the second of said group of cylinders in tandem, the said third tube having fastened close to its other end and concentric with its axis a pair of solenoid coils separated from each other by a distance of approximately 1 inch;

a disk whose outer diameter is approximately 2 inches less in diameter than the inside diameter of the pipe mounted over the end of the said third tube;

a fourth telescoping tube within the said third tube whose one end is fastened to a third piston slidable within the third cylinder in tandem and extending beyond the third piston, the other end of the said fourth tube extending beyond the end of the said third tube and having fastened to it beyond the end of the third tube a second clamping device electrically insulated from said fourth tube for clamping the second of two pipes to be welded together; flange means fastened to the end of said fourth tube for retaining the said second clamping means in a fixed position on the outer surface of the said tubing, said flange having means for supporting an inner bead cleaning tool on its outer surface so that the tool lies along the axis of the said tubing; and means for producing an alternating current arc between the ends of the pipes to be welded.

3,882,300

MEANS IN WELDING TOOLS FOR WELDING WITH WELDING ELECTRODES AND MEANS FOR SMOKE REMOVAL

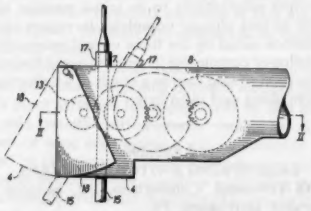
Jan Anders Rolf Karlsson, Liedbergsgatan 43, S-352 32 Vaxjo, Sweden

Filed Oct. 30, 1973, Ser. No. 411,077

Claims priority, application Sweden, May 17, 1973, 7354264; Oct. 30, 1972, 5803/72

Int. Cl. B23k *9/12*

U.S. Cl. 219—130 **8 Claims**



1. A welding tool comprising a consumable rod electrode having a working end and a contact end, a hollow casing directly surrounding said electrode and having an opening adapted to face a welding zone, means for supporting said electrode within said casing and for selectively feeding said electrode to present the working end of said electrode toward said opening as said electrode is consumed, means for connecting the contact end of said electrode to a source of current and a conduit connected to said casing and communicating with its interior leading to a source off suction for removal of smoke produced during welding from about said electrode.

3,882,301

RETROSPECTIVE PULSE MODULATION INCLUDING BAR CODING AND APPARATUS THEREFOR

Ernie George Nassimbene, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

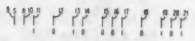
Continuation of Ser. No. 183,968, Sept. 27, 1971, abandoned, which is a division of Ser. No. 31,959, April 27, 1970, Pat No. 3,708,748. This application July 13, 1973, Ser. No. 379,017

Int. Cl. G06k *9/18;* **G01d** *15/12;* **G01n** *21/30;* **G06k** *7/10;* **H03k** *7/00*

U.S. Cl. 235—61.11 E **19 Claims**

1. Retrospective pulse modulating apparatus comprising means for generating a train of impulses at substantially equal intervals therebetween,

means for inputting binary information to be conveyed,
means for varying the intervals between said impulses in accordance with said binary information to be conveyed, said interval varying means including,



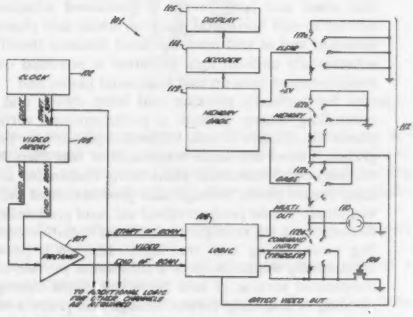
means for storing an indication of a preceding interval, and means coupled to said storing means, to said generating means and to said data inputting means for enabling an impulse in relation to a data bit in accordance with both the binary information of that data bit and the duration of the interval preceding that data bit.

3,882,302

ELECTRO-OPTICAL MEASURING DEVICE

Arthur C. Deichmiller, North Branford, Conn., and Jack C. von der Heide, Arlington, Tex., assignors to Universal Technology, Inc., Woodbridge, Conn.

Filed Feb. 20, 1973, Ser. No. 333,960
Int. Cl. G06m *3/14*
U.S. Cl. 235—92 DN **19 Claims**



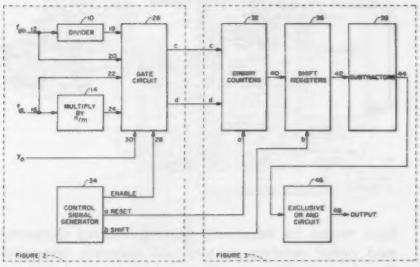
1. A device for comparing the corresponding dimensions of a master specimen and a plurality of unknown specimens, comprising:
means for directly measuring a corresponding linear size dimension of a master specimen and a plurality of unknown specimens to produce a plurality of digital signals, said plurality comprising:
a first digital signal defining said linear size dimension of said master specimen; and
a plurality of second digital signals defining said corresponding linear size dimension of said plurality of unknown specimens;
a memory for storing said first digital signal obtained from direct measurement of said linear size dimension of said master specimen;
means for repetitively producing an output signal from said memory indicative of said first digital signal, said means not removing said first digital signal from said memory; and
means for comparing respective ones of said plurality of second digital signals representative of the corresponding linear size dimensions of said unknown specimens with respective memory output signals.

3,882,303

DIGITAL FREQUENCY CORRELATOR

John L. Linder, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1974, Ser. No. 459,146
Int. Cl. G06f *7/50, 15/20*
U.S. Cl. 235—151.3 **11 Claims**



1. A digital frequency correlator circuit for digitally comparing the frequencies of a plurality of a-c signals to determine if they are coherent within a predetermined number of cycles comprising:
a. means for providing a plurality of first a-c signals;
b. means for receiving said plurality of first a-c signals and converting each of said first a-c signals into a digital number representing the frequency of each first a-c signal;
c. means for generating and providing control signals to said means for providing a plurality of first a-c signals and to said means for converting each of said first a-c signals into a digital number representing the frequency of each first a-c signal, said control signals synchronizing the operation of said means for providing a plurality of first a-c signals and said means for converting each of said first a-c signals into a digital number representing the frequency of each first a-c signal;
d. means for receiving each said digital number and comparing each said digital number with each other said digital number and outputting a logic 0 whenever any comparision of two said digital numbers exceeds a predetermined number of cycles and outputting a logic 1 whenever any comparison of two said digital numbers is equal to or less than a predetermined number of cycles, said means having a separate output for each said comparison.

3,882,304

PARAMETRIC INTERPOLATION OF THREE-DIMENSIONAL SURFACES

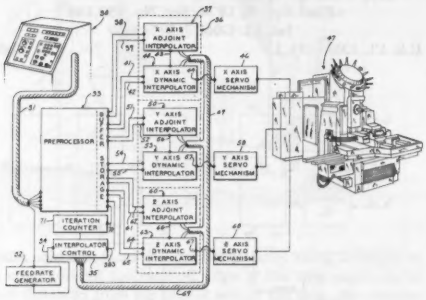
Ronnie G. Walters, Painesville, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed May 4, 1973, Ser. No. 357,321
Int. Cl. G06f *7/38;* **G06g** *7/30*
U.S. Cl. 235—151.11 **55 Claims**

1. An interpolation system, the combination comprising:
a preprocessor having input means for receiving an ordered set of input data which relates to a spacial form to be reproduced, including the coordinate values of selected data points on the spacial form, said preprocessor including means for calculating the elements of an initial state vector which describes said spacial form at one of said selected data points, means for calculating the elements

of an initial steering vector, and means for storing the elements of an initial complex state vector which defines the spacial form and which includes the elements of said initial state vector and the elements of said initial steering vector;

a mapping interpolator having input means connected to receive the initial complex state vector elements generated by the preprocessor and including adjoint interpolator means for iteratively altering the values of selected elements of said initial state vector, and dynamic interpolator means for iteratively altering selected elements of said initial steering vector, said mapping interpolator thereby performing a state transition on the initial complex state vector;



interpolation control means connected to control the iterations of said mapping interpolator; and

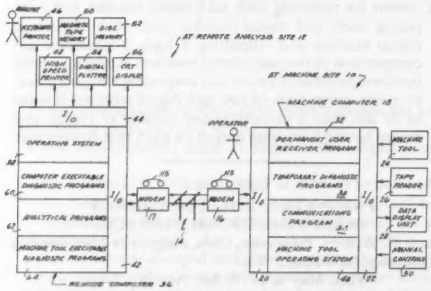
controlled means for reproducing said spacial form, said controlled means being connected to continuously receive selected elements of said complex state vector which are iteratively generated by said mapping interpolator during said state transition.

3,882,305

DIAGNOSTIC COMMUNICATION SYSTEM FOR COMPUTER CONTROLLED MACHINE TOOLS

Richard Johnstone, Brookfield, Wis., assignor to Kearney & Treaker Corporation, Milwaukee, Wis.

Filed Jan. 15, 1974, Ser. No. 433,439
Int. Cl. G06f *15/20, 15/46*
U.S. Cl. 235—151.11 **13 Claims**



1. In a computer controlled machine tool system having a machine tool, a computer for said machine tool, and a power drive means connected to effect operation of said machine tool in response to signals from said computer, the combination comprising:

a. control means located at a site remote from said machine and connected to said computer for controlling said computer to operate said machine,

b. means responsive to operation of said machcine tool for communicating selected data from said machine site to said remote site,

c. means located at said remote site for comparing said selected data with predetermined data, and

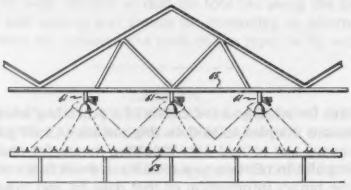
d. means for manifesting a difference between said selected data and said predetermined data.

3,882,306

OSCILLATING LIGHT APPARATUS

J. Delvin Armstrong, 2224 137th Pl. SE, Bellevue, Wash. 98005

Filed Aug. 31, 1973, Ser. No. 393,618
Int. Cl. F21m *7/00*
U.S. Cl. 240—48 **11 Claims**



1. An apparatus for supplying light energy to plants to substantially aid in the growth thereof, comprising:

high intensity lamp means operable when energized to emit light radiation of a wavelength and in sufficient quantity to stimulate plant growth;

means pivotally supporting said lamp means a predetermined distance from the plants, which plants are arranged in substantially a horizontal plane below said lamp means; means partially surrounding said lamp means for controlling the direction of said light radiation, wherein said radiation controlling means is so configured and arranged that when said lamp means is positioned substantially normal to said horizontal plane on which said plants are arranged and at said predetermined distance therefrom, substantially uniform light radiation is provided over a predetermined area on said horizontal plane; and

means for cyclically pivoting said lamp means and said controlling means through a predetermined vertically planar arc relative to said horizontal plane, wherein the predetermined arc has a magnitude of less than 90°, a section of said horizontal plane being illuminated as said lamp means pivots through said predetermined arc, the magnitude of said predetermined arc, said predetermined distance, and the configuration of said radiation controlling means being such that light radiation is provided substantially uniformly over a substantial portion of the illuminated section of said horizontal plane during the pivoting of said lamp means through said predetermined arc.

3,882,307

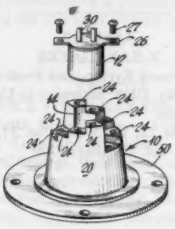
LAMP SOCKET MOUNT

Viggo Bech Rambusch, New York, N.Y., and Peter White, Montclair, N.J., assignors to Rambusch Decorating Company, New York, N.Y.

Filed Apr. 5, 1973, Ser. No. 348,074
Int. Cl. F21v *19/02*
U.S. Cl. 240—44.2 **7 Claims**

4. A lamp socket mount comprising a body having an opening extending therethrough, one end of said body being recessed to form a plurality of pairs of axially spaced stepped seats, a lamp socket disposed within and slidably engaging the opening in said body, said socket having a base with lugs extending outwardly, therefrom for engaging selected pairs of stepped seats said socket being adapted to carry a lamp extending from the other end of said body, means on the other end of said body carrying a reflector having a central opening

and extending outwardly therefrom in surrounding relationship to said lamp and means engaging said lugs for securing



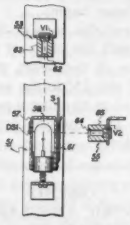
them to selected pairs of seats to adjustably position said lamp relative to said reflector.

3,882,308

DETECTION SYSTEM FOR SUPERPOSED SHEETS

John W. Daughton, Fairport, and Gary L. Schluntz, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 6, 1970, Ser. No. 25,804
Int. Cl. H01j *39/12*
U.S. Cl. 250—222 R **1 Claim**



1. In a recording machine in which copy sheets are advanced through copy processing stations along a predetermined path, an improved detection apparatus for detecting multiple superposed sheets at a sheet detection station comprising

means for feeding sheet material along a sheet path past copy processing stations,

illumination means positioned along the sheet path at a sheet detection station,

first photosensitive means for receiving illumination from said illumination means,

second photosensitive means for receiving illumination from said illumination means,

sample sheet material interposed between said illumination means and said second photosensitive means,

first circuit means for generating discrete electrical signals representative of the transmittance of sheet material to be detected,

second circuit means responsive to the transmittance of the sample sheet material for generating a signal representative of the transmittance of said sample sheet material,

third circuit means for comparing the signals generated from said first and second circuit means and determining the presence of multiple superposed sheets and generating an output signal to machine control to de-energize the machine when a multiple superposed sheet condition occurs at the sheet detection station, and

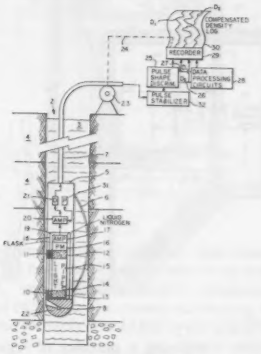
means for maintaining a multiple superposed sheet output condition in the event that a failure of said illumination means occurs.

3,882,309

DUAL SCINTILLATION DETECTOR, SINGLE PHOTOMULTIPLIER DENSITY LOGGING SYSTEM

Hans J. Paap, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed July 30, 1973, Ser. No. 383,942
Int. Cl. G01t *1/20*
U.S. Cl. 250—264 **11 Claims**



1. A gamma ray density well logging system comprising:

a fluid tight hollow sonde sized and adapted for passage in a well borehole and having disposed therein a source of medium energy gamma rays and means for selectively irradiating preferred portions of earth formations in the vicinity of a well borehole with said gamma rays, first scintillation detector means longitudinally spaced from said source and having first phosphorescent decay characteristics, second scintillation detector means longitudinally spaced from said source and said first scintillation detector means and having second, substantially different phosphorescent decay characteristics, means situated between said detector means for optically coupling said first and second scintillation detector means and effectively shielding said detectors from each other with respect to gamma radiations, means optically coupled to said first and second scintillation detectors for generating first and second voltage pulses in response to scintillations occurring in said first and second detectors, said first and second voltage pulses having substantially different shape characteristics due to the difference in said first and second phosphorescent decay characteristics, means for transmitting said voltage pulses from said sonde to the surface of the earth and means for separating said first and second voltage pulses from each other on the basis of their substantially different shape characteristics.

3,882,310

SPATIALLY MODULATED IMAGING SYSTEM

Harrison H. Barrett, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

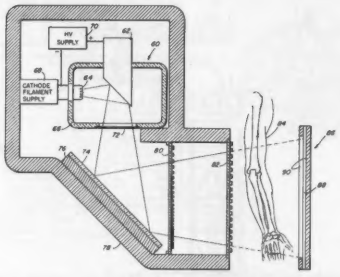
Division of Ser. No. 302,992, Nov. 1, 1972, Pat. No. 3,801,785, and a continuation-in-part of Ser. No. 303,167, Nov. 2, 1972, which is a division of Ser. No. 77,459, Oct. 2, 1970, Pat. No. 3,748,470, and a continuation-in-part of Ser. No. 250,224, May 4, 1972, Pat. No. 3,829,688. This application Sept. 26, 1973, Ser. No. 400,768
Int. Cl. G01t *1/16*
U.S. Cl. 250—320 **7 Claims**

1. The method comprising the steps of:

introducing into at least selected regions of an object comprising living tissue a substance having a substantially different absorption coefficient of X-rays at a predetermined energy level than said absorption coefficient of said living tissue adjacent said selected regions;

spatially recording at least components of spatially distributed patterns of X-rays predominantly concentrated in regions respectively above and below said predetermined energy level which have passed through said object;

said spatially distributed patterns of said X-rays having at least components of a spatially varying periodicity formed by the steps comprising directing said X-rays through a



structure comprising a plurality of regions of different sizes substantially permeable to said X-rays separated by regions which are substantially less permeable to said X-rays and which have a thickness in a direction parallel to the average direction of motion of said X-rays through said structure which is less than the average dimension of said permeable regions transverse to said direction; and

deriving an image of the differences in absorption of different regions of said object to said X-rays by steps comprising spatially subtracting at least portions of said spatially recorded components derived from said energy level pattern above said predetermined energy level from said pattern below said predetermined energy level.

3,882,311

FILM FOR COLOR RADIOGRAPHS

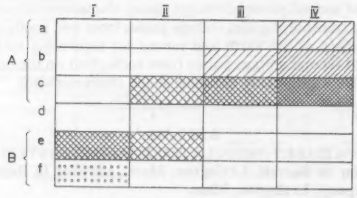
Vasile Voinea, Bucharest, Romania, assignor to Spitalul de Copii "Calarasi", Bucharest, Romania

Filed Sept. 11, 1972, Ser. No. 288,084

Claims priority, application Romania, Sept. 9, 1971, 68172; July 25, 1972, 71745

Int. Cl. G03b *41/16*

U.S. Cl. 250—472 **2 Claims**



1. A radiographic film for color portrayal of an image, comprising a radiation-transparent support layer, a high radiosensitivity first layer of one of the primary colors on one side of said support layer, a moderate radiosensitivity second layer on said high radiosensitivity layer and of a second primary color, a low radiosensitivity layer on said moderate radiosensitivity layer and of a third primary color, a reversal layer providing one of said primary colors in the absence of irradiation through said support layer and coated onto the other side thereof, said reversal layer having a high radiosensitivity, and another reversal layer of another of said primary colors and a reduced radiosensitivity on the first-mentioned reversal layer.

3,882,312

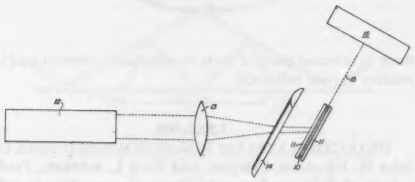
X-RAY LASERS

John G. Kepros; Edward Eyring, and Fredric William Cagle, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed June 22, 1973, Ser. No. 372,565

Int. Cl. H01s *3/09*

U.S. Cl. 250—493 **10 Claims**



1. A method of producing collimated radiation of the x-ray wave length comprising;

obtaining a laser operable to produce a pulse of laser radiation in the near infrared spectrum;

orienting a focusing system so as to focus the pulse of laser radiation into a linear beam;

placing a layer of metallic ions in the focal range of the focusing system with the plane of the layer being transverse to the plane of the beam, the angle of the layer being between 6° and 25° to the axis of the beam; and

triggering the laser so as to cause a pulse of laser energy to excite the metal ions thereby generating a collimated beam of x-radiation.

3,882,313

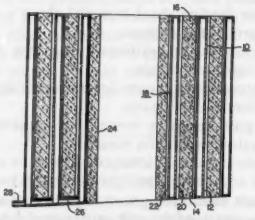
CONCENTRIC ANNULAR TANKS

Dan H. Siemens, Jr., Richland, Wash., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 7, 1972, Ser. No. 304,452

Int. Cl. G21f *1/00*

U.S. Cl. 250—507 **8 Claims**



1. Concentric annular tanks with isolation for the storage of solutions containing nuclear materials comprising:

a first annular hollow tank having a tubular inside and outside wall concentrically formed with a bottom plate sealably affixed therebetween at one of the corresponding tubular end terminations so as to form the bottom wall thereof;

a second annular hollow tank having a tubular inside and outside wall concentrically formed with a bottom plate sealably affixed therebetween at one of the corresponding tubular end terminations so as to form the bottom wall thereof, said second tank being concentrically positioned

within the interior annular opening formed by said inside wall of said first tank; and

isolation means associated with said first and second tanks having a neutron capture cross section sufficient to guard against the formation of a critical mass of nuclear material between the storage contents of said first and second tanks.

3,882,314

DEVICE FOR X-RAY TREATMENT

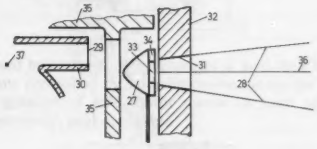
Riccardo Benedetti; Rudolf Meyer; Franz Petersilka; Rudolf Schittenhelm; Leonhard Taumann, all of Erlangen, and Wolf-Eberhard Schiegl, Weisendorf, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 8, 1974, Ser. No. 440,706

Claims priority, application Germany, Feb. 10, 1973, 23065198

Int. Cl. G03b *41/16*

U.S. Cl. 250—505 **4 Claims**



1. A device for X-ray treatment, comprising an electronic accelerator, an anticathode exposed to the accelerated electrons for producing X-rays, an adjustable collimator for X-rays, at least one member for equalizing the density of the X-rays in the cone of X-rays passing the collimator adapted to be shifted into the X-ray cone, supervising devices for the correct positioning of said member, and two ray detectors connected to said supervising devices in the part of the X-ray cone which is not influenced by said collimator for increasing operational safety, the first one of say ray detectors being located centrally to the central ray of the X-ray cone passing the collimator behind said equalizing member, the second of said ray detectors being located to the side of said central ray, wherein, in the ray direction the two ray detectors are located in front of said collimator and said equalizing member, wherein said first ray detector, located centrally to the central ray of the X-ray cone, has the shape of a circular disk, and wherein the second ray detector surrounds annularly the first ray detector, the two ray detectors being fixed to said equalizing member, and wherein the two ray detectors are equally sensitive toward X-rays and have equal surfaces directed to the X-ray source, said supervising devices comprising an alarm device and a differential amplifier connected to the two ray detectors and to said alarm device.

3,882,315

SHIPPING CONTAINER FOR A BOTTLE OF RADIOACTIVE MATERIAL

Donald W. Soldan, St. Louis, Mo., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed Apr. 12, 1973, Ser. No. 350,402

Int. Cl. G21f *5/00*

U.S. Cl. 250—506 **9 Claims**

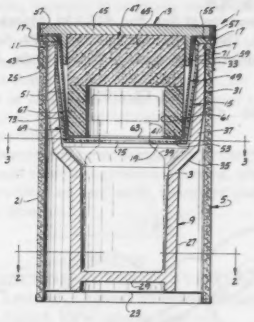
1. A shipping container for a bottle which contains a radioactive material, the bottle having a neck, said container comprising

an outer container having an open top,

a receptacle constituting a safe within the outer container, said safe being open at the top for receiving a bottle,

a closure removably secured to said outer container for closing the top of the safe,

and a bottle retainer removably mounted in the safe extending downwardly in the safe from the upper end of the latter having an upper end portion disposed between the closure and the upper end of the safe and a lower end portion formed relatively closely to receive the neck of a bottle in the safe, said closure, when secured to said outer container positively holding said safe and said retainer in



position within the outer container, said closure having means on the bottom thereof for absorbing spillage from the bottle, said absorbing means comprising sponge means held captive to the closure and having a recess in its lower end for reception of the upper end of the bottle.

3,882,316

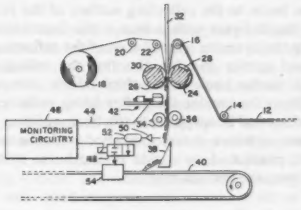
QUALITY CONTROL MONITOR FOR MEDICINAL CAPSULE PACKAGING APPARATUS

Charles R. Garris, Stratford, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed May 24, 1973, Ser. No. 363,346

Int. Cl. H01j *39/12*

U.S. Cl. 250—560 **7 Claims**



1. A quality control monitor for medicinal capsule packaging apparatus comprising:

means for photoelectrically sensing the presence of medication in a capsule and providing an electrical signal the time duration between the onset and the cessation of said signal being a function of the quantity of medication in the capsule, and

means, establishing a predetermined time interval and providing an indication whether said duration of the electrical signal is greater or less than the predetermined time interval, including a first monostable multivibrator connected to be triggered to its unstable state at the onset of said electrical signal, a second monostable multivibrator, and gating means responsive to said electrical signal and to the output of the first multivibrator for triggering the second multivibrator to its unstable state if and only if the first monostable multivibrator returns to its stable state during said duration of said electrical signal.

3,882,317
APPARATUS FOR READING A ROTATING DISC-SHAPED RECORD CARRIER

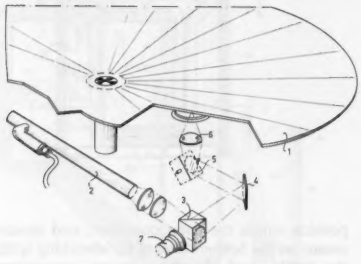
Eduard Camerik, and Daniel Ong, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 345,134, March 26, 1973, abandoned. This application July 23, 1974, Ser. No. 490,944

Claims priority, application Netherlands, Aug. 26, 1972, 7211676

Int. Cl. G01n *21/30*

U.S. Cl. 250—570 **6 Claims**



1. Apparatus for reading a rotating disc-shaped record carrier which contains optically encoded signals on a reflective lower surface thereof, comprising a gas laser beneath the record carrier providing a radiation beam along a first path parallel to the surface of the record carrier, a beam splitting mirror in the path of the radiation from the radiation source oriented to reflect the radiation from the radiation source along a second path parallel to the record surface and normal to the direction of the beam from the radiation source, a second mirror in the path of the light from the beam splitting mirror and oriented to reflect the beam from the beam splitting mirror along a third path parallel to the first path, a third mirror positioned in the third path and oriented to reflect the radiation beam to the reflecting surface of the record carrier along a fourth beam path, a lens in the fourth beam path for focussing the beam on a small area of the reflecting surface of the record carrier and for directing the radiation reflected from the carrier back to the third mirror, the radiation reflected from the carrier thereafter being reflected along the third and second beam paths to the beam splitting mirror, and a radiation-sensitive detector aligned with the second beam path and positioned on a side of the beam splitting mirror remote from the second mirror.

3,882,318
DETECTOR MEANS FOR AN AUTOMATIC CHEMICAL TESTING APPARATUS

George Tadeusz Mioduski, Bellaire, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed Jan. 21, 1974, Ser. No. 435,227

Int. Cl. G01n *21/26*

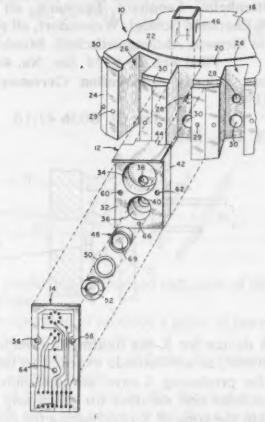
U.S. Cl. 250—576 **22 Claims**

9. In automatic chemical testing apparatus capable of performing a plurality of chemical tests on a specimen to determine the amount of different selected substances therein, each test being performed by mixing, in a separate reaction container, a predetermined amount of said specimen with at least one reagent selected for that test, by thereafter inserting each container in a chamber of said apparatus for that test, and, at a given time thereafter, by measuring the radiant energy at a wavelength specified for that test which is transmitted through that mixture, the improvement comprising:

a source of radiant energy;

radiant energy source housing means for containing said source at a position interior to the perimeter thereof, said perimeter having a plurality of cutaway portions selected ones of which are used to perform said tests, each cutaway portion forming in part a chamber for holding a container, said housing means including a pair of energy transmission paths for each of said selected cutaway portions for transmitting radiant energy from said source to each of said selected cutaway portions; and

detection means for and affixed to each of said selected cutaway portions to form a test chamber, each detection means having a first and a second radiant energy detector



positioned therein in alignment with a different one of said energy paths when said detection means is affixed to said source housing means, one of said detectors providing a signal manifesting the presence of a container in said formed chamber and the other of said detectors providing a signal manifesting the transmittance thereto of radiant energy of a specific wavelength transmitted through said formed chamber, said specific wavelength being the wavelength specified for the test being performed in that formed chamber.

3,882,319
AUTOMATIC MELT LEVEL CONTROL FOR GROWTH OF SEMICONDUCTOR CRYSTALS

Donald R. Clement, Scottsdale; Larry D. Mason, Phoenix, and Carl A. Helber, Scottsdale, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 23, 1973, Ser. No. 408,897

Int. Cl. G01n *21/26*

U.S. Cl. 250—577 **16 Claims**

14. Apparatus for pulling solid crystals from a melt wherein the level of said melt is maintained constant during the time that the crystal is being pulled comprising:

a container for said melt;

motor means for raising and lowering said container;

first red source means for transmitting, at one angle to the vertical, a first radiation beam to the level surface of said melt;

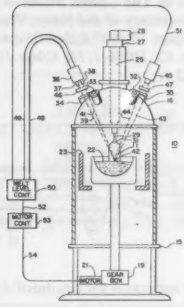
second red source means for transmitting, at another angle to the vertical, a second radiation beam to the level surface of said melt;

sensor means for receiving the sum of the reflections of said first and said second radiation beams;

said sensor means being disposed at an angle to the vertical to encompass the reflections of said first and said second radiation beams;

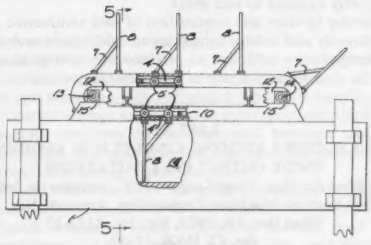
means for alternately energizing said first and said second source means at a high frequency rate;

means for focusing each of said first and said second radiation beams on the same spot at a designated melt level;
said sensor means including means responsive to changes in said first and said second reflected radiation beams



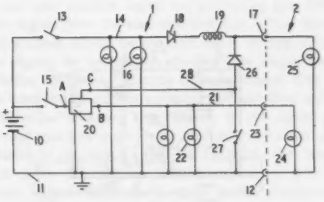
caused by corresponding changes in said melt level; and means controlled by said responsive means for effecting energization of said motor means to raise and lower, respectively, said container.

3,882,320
TIDE ENERGY CONVERSION DEVICE
Edmund Schmeller, Chewelah, Wash. 99109
Filed Dec. 20, 1973, Ser. No. 409,013
Int. Cl. F03b *13/12*
U.S. Cl. 290—43 **3 Claims**



1. An apparatus for producing electrical energy from directional flow of water, comprising:
a supporting base fixedly located upwardly adjacent to a moving surface of a body of water;
a pair of elongated endless rigid channel members fixed to the base in transversely spaced relationship facing one another, said channel members extending along the base parallel to the direction of movement of the water surface, each channel member having a lower flight extending along said base adjacent to the water surface and an upper flight spaced vertically above its lower flight, the lower and upper flight being interconnected by vertical arcuate end sections formed integrally therewith;
a rigid roller frame including two pairs of transversely spaced coaxial rollers, one pair of said rollers being engaged in each channel member for structural support of the roller frame and for rolling movement along the lower and upper flights are arcuate end sections thereof;
a transverse elongated blade extending outward from and substantially perpendicular to said channel members across the device in a direction transverse to the direction of movement of said water surface, said blade being fixed to the roller for movement therewith along said channel members;
a diagonal brace fixed between the roller frame and said blade;
said blade extending outward from the channel members a distance sufficient to enable it to extend downwardly into the water when supported along said lower flights and thereby being movable in response to the flow of water;
an output shaft;
endless drive means movably mounted to the base parallel to said channel members and operatively connected between said roller frame and said shaft for converting movement of said roller frame with respect to said base into rotational movement of said shaft;
electrical generating means;
and motion transmitting means operatively connecting said shaft and said electrical generating means, whereby rotational movement of said shaft energizes said electrical generating means.

3,882,321
VEHICLE ELECTRICAL SYSTEMS
Gordon Harris Leonard, Chalfont St. Peter, England, assignor to C. A. V. Limited, Birmingham, England
Continuation-in-part of Ser. No. 332,141, Feb. 13, 1973, abandoned. This application Nov. 5, 1973, Ser. No. 412,824
Claims priority, application United Kingdom, Feb. 19, 1972, 7782/72
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 LS **9 Claims**

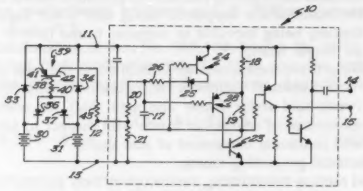


1. A vehicle electrical system comprising a load sensitive unit which controls current flow from a first point of electric supply on the vehicle to a first lamp on the vehicle, the system being adapted to have a second lamp connected in parallel with the first lamp, a third lamp associated with said second lamp, a second point of electric supply on the vehicle, said third lamp when said second lamp is connected in parallel with said first lamp, is connected to said second point of electric supply of the vehicle, and sensing means for sensing the connection of said third lamp to said second point of electric supply, said sensing means acting to modify the operating characteristics of said unit.

3,882,322
PULSE GENERATOR
David H. Gobeli, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Jan. 26, 1973, Ser. No. 326,794
Int. Cl. H02j *7/00*
U.S. Cl. 307—65 **17 Claims**

1. In a pulse generator of the type having pulse timing means, having a power supply comprising a plurality of power sources connected in parallel and having means connected to each of said power sources for disconnecting any power source from said power supply upon a differential depletion thereof, the improvement which comprises:
resistive means electrically connected to the pulse timing means; and
means operatively connected to said resistive means and said power sources for altering the timing characteristics of said pulse timing means by switching the current flow

in said resistive means between a conducting state and a non-conducting state in response to a differential depletion of at least one of the power sources with respect to the others.

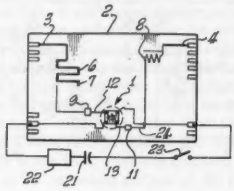


3,882,323

METHOD AND APPARATUS FOR PROTECTING SENSITIVE INFORMATION CONTAINED IN THIN-FILM MICROELECTONIC CIRCUITRY

Gary Smolker, Venice, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,405
Int. Cl. H05k *1/18;* **C06b** *19/00*
U.S. Cl. 307—202 A **5 Claims**



1. Self-destruct two-part microelectronic circuit apparatus comprising:

a first electrical circuit formed of an incomplete network of circuit elements,

a wafer-like circuit chip, and

a second electrical circuit carried by said chip and having a network of resistive elements, said first and second circuits being adapted to be detachably interconnected for electrically completing said two-part microelectronic circuit;

said chip including:

a glass like substrate,

an ignitable self-destruct thin film sandwich formed of aluminum and a metal oxide deposited adjacently one on the other on said substrate, said film sandwich having an auto ignition temperature of about 1500°F and being capable when ignited to produce an exothermic chemical reaction sufficient to sustain combustion,

ignition means coupled to said film sandwich

a thin electrical insulator film deposited on said sandwich, and

the aforementioned network of resistor elements; said network being formed from a thin film of electrically resistive material deposited on said insulative film,

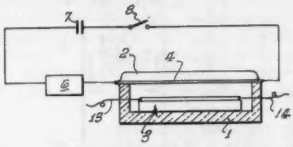
whereby information contained in said resistive network can be destroyed by igniting said film sandwich, the heat of reaction of said ignited sandwich mechanically distorting said insulative film sufficiently to destroy said resistive network deposited thereon.

3,882,324

METHOD AND APPARATUS FOR COMBUSTIBLY DESTROYING MICROELECTRONIC CIRCUIT BOARD INTERCONNECTIONS

Gary Smolker, Venice, and Leon Chernick, Encino, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,406
Int. Cl. H05k *1/18;* **C06b** *19/00*
U.S. Cl. 307—202 A **6 Claims**



1. Self-destruct apparatus for combustibly destroying circuit board electrical interconnectors comprising:

a box-like enclosure,

a microelectronic circuit board provided on one of its surfaces with electrical circuit interconnectors formed of superimposed films of metallized electrically-conductive exothermically-reactive materials adapted when ignited to self-destructively maintain combustion,

an ignitable and combustible sheet formed of exothermically reactive materials having an auto-ignition temperature approximating that of said interconnector materials, and

remotely-controllable means of igniting said sheet,

said circuit board and said ignitable sheet being disposed in a spaced relationship within said box-like enclosure with said circuit board interconnectors spanned by and directly exposed to said sheet,

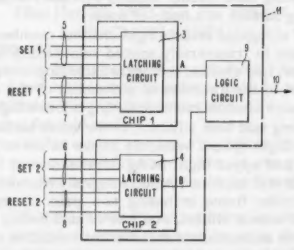
whereby ignition and combustion of said exothermic sheet directly and indirectly applies to said interconnectors a temperature sufficient to produce the auto-ignition and the desired destruction of said interconnectors.

3,882,325

MULTI-CHIP LATCHING CIRCUIT FOR AVOIDING INPUT-OUTPUT PIN LIMITATIONS

Fred Elias Sakalay, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,627
Int. Cl. H02k *17/00*
U.S. Cl. 307—218 **9 Claims**



1. A composite latching circuit receiving a plurality of set signals and a plurality of reset signals comprising:

a first constituent latching circuit receiving at least one of said set signals and the associated one of said reset signals,

a second constituent latching circuit receiving the remainder of said plurality of set and reset signals,

each said constituent latching circuit providing an output signal representing the state thereof, and

a logic circuit operative as a positive OR circuit for input signal amplitude changes in one direction and as a positive AND circuit for input signal amplitude changes in the opposite direction,

said output signal from each said constituent latching circuit being applied to said logic circuit as said input signals.

3,882,326

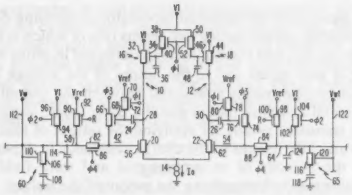
DIFFERENTIAL AMPLIFIER FOR SENSING SMALL SIGNALS

Robert Henry Kruggel, Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,591

Int. Cl. H03k *5/20*; **G11c** *11/24*; **H03k** *5/18*

U.S. Cl. 307—235 R **17 Claims**



17. A sensing circuit comprising

a constant current sink,

a constant voltage source,

first and second serially connected transistors coupling said constant voltage source to said constant current sink, said second transistor being interposed between said first transistor and said constant current sink, each of said transistors having a gate electrode,

third and fourth serially connected transistors coupling said constant voltage source to said constant current sink, said fourth transistor being interposed between said third transistor and said constant current sink, said third and fourth transistors having gate electrodes,

a first alternating current feedback circuit coupled to the common point between said first and second transistors, a second alternating current feedback circuit coupled to the common point between said third and fourth transistors,

a first capacitor connected between the gate electrode of said first transistor and the common point between said first and second transistors,

a second capacitor connected between the gate electrode of said third transistor and the common point between said third and fourth transistors,

means coupled to the gate electrodes of said first and third transistors for periodically charging said first and second capacitors, and

means for applying a differential input signal between the gate electrodes of said second and fourth transistors,

each of said first and second feedback circuits including a voltage source, a field effect transistor, having a gate electrode, coupling said voltage source to said input signals applying means and a capacitor coupled between one of said common points and the gate electrode of said field effect transistor and means for applying a bias voltage to the gate electrode of said field effect transistors.

3,882,327

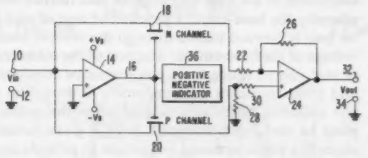
ABSOLUTE VALUE CIRCUIT EMPLOYING OPPOSITE CONDUCTIVITY TYPE SWITCHES

Alfred Brown, Jr., Philadelphia, Pa., and Kenneth Mansfield Schlesier, Stockton, N.J.

Filed June 7, 1974, Ser. No. 477,189

Int. Cl. H03k *5/00*

U.S. Cl. 307—236 **12 Claims**



1. A circuit comprising:

at least one input terminal adapted for connection to a source of input signals;

a signal comparator means responsive to said input signals and to a reference signal level for providing one control signal when the input signal is at one polarity relative to said reference signal level and a second control signal when the input signal is at another polarity relative to said reference signal level;

first and second semiconductor switching devices of opposite conductivity types, said first device being responsive to said one control signal for providing one low impedance signal path for said one polarity of the input signal, said second device being responsive to said second control signal for providing another low impedance signal path for said other polarity of input signal; and

signal translation means coupled to said first and second devices for inverting the polarity of the signal provided via said one low impedance path and for maintaining the polarity of the signal provided via said other low impedance path, said signal translation means providing an output signal substantially equal to the absolute value of the input signal.

3,882,328

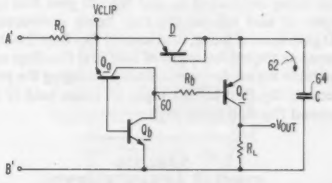
CROSS OVER DETECTOR AND RECTIFIER

James Dimitri Mazgy, Parsippany, N.J., and Henry Martin Kleinman, Boca Raton, Fla., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,655

Int. Cl. H03k *5/08*, *5/153*, *17/30*

U.S. Cl. 307—237 **18 Claims**



3. A clamping and zero crossing detection circuit adapted for use in integrated form comprising

a pair of transistors of like conductivity type each having emitter, base and collector electrodes;

a pair of input terminals adapted for connection to a periodically varying source of potential, each of said terminals connected to a respective one of said emitter electrodes;

means for connecting said base electrodes in common circuit;

means for connecting said collector electrodes in common circuit;

a further transistor having an emitter, a base, and a collector electrode;

output means connected in series circuit with the emitter-to-collector path of said further transistor;

means for connecting said series circuit in circuit with said input terminals;

means for connecting said commonly coupled collector electrodes to the base electrode of said further transistor, whereby the base-emitter junction of one of said transistor pair is forward biased through the reverse breakdown voltage of the base-emitter junction of the other transistor of said pair to render said one transistor conductive and said other transistor nonconductive between the emitter and collector electrodes thereof when the potential applied to said input terminals is of a given polarity and exceeds a predetermined magnitude to provide an indication of the zero crossing point of said periodically varying source at said output means.

3,882,329

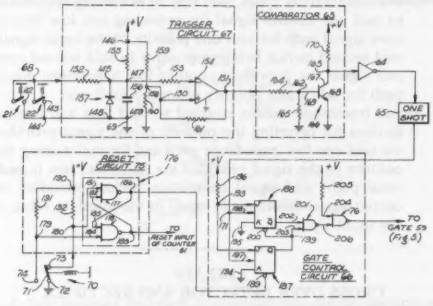
GATE GENERATOR WITH J-K FLIP-FLOPS

Walter Fah Min Tyau, Orange, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Division of Ser. No. 304,997, Nov. 9, 1972, Pat. No. 3,832,883. This application Jan. 21, 1974, Ser. No. 435,257

Int. Cl. H03k *17/00, 3/12*

U.S. Cl. 307—247 R **1 Claim**



1. A gate generator comprising: first and second JK flip-flops each having inhibit, J, K and drive inputs, and Q and Q outputs; a D.C. source of potential; a resistor connected from said D.C. source to each J input, both K inputs being connected to ground; a source of pulses, both drive inputs being connected from said pulse source, a NAND gate having first and second inputs and an output, said Q output of said first flip-flop being connected to said NAND gate first input, said Q output of said second flip-flop being connected to said NAND gate second input, said second flip-flop Q output being connected to the inhibit input of said first flip-flop; and manually operable means for momentarily changing the potential at said second flip-flop inhibit input to cause said Q output of said second flip-flop to be high.

3,882,330

CIRCUIT ARRANGEMENTS

Robert Keith Portway Galpin, Marlow, England, assignor to Plessy Handel und Investments A.G., Zug, Switzerland

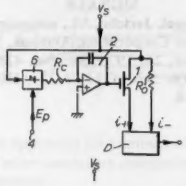
Filed Apr. 11, 1973, Ser. No. 350,213

Claims priority, application United Kingdom, Apr. 13, 1972, 17111/72

Int. Cl. H03k *1/14*

U.S. Cl. 307—264 **6 Claims**

1. A variable gain circuit arrangement for use in or with an adaptive equaliser comprises integrator means having an input for the application thereto of an applied electrical signal and an output, field effect transistor means connected in the output of said integrator means, a constant voltage source connected directly to the junction of the field effect transistor means and the electrical impedance, and combining means for selectively combining outputs from the field effect transistor means and electrical impedance to afford a required output, modulator means to which the signal is applied, the output of the modulator means being fed to the integrator means, the output of the modulator means being applied to the integrator means via a charge resistance, the modulator means taking the form of a balanced modulator which is operated in dependence upon the output of the voltage source and a derived



error signal, and the balanced modulator comprising differential amplifier means having two inputs one of which is earthed and an output, first resistor means connected in series with the other of said inputs and to the output of the voltage source, second resistor means connected between the output of the differential amplifier means and the other input, second field effect transistor means for applying the output of said differential amplifier means to the charge resistance in dependence upon the polarity of an error signal and third field effect transistor means for applying the output of the voltage source to the charge resistance in dependence upon the inverse of the polarity applied to said second field effect transistor means.

3,882,331

HYSTERESIS CIRCUITS USING INSULATED GATE FIELD EFFECT TRANSISTORS

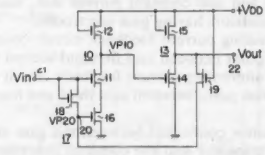
Minoru Sasaki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,726

Claims priority, application Japan, Mar. 5, 1973, 48-25163

Int. Cl. H03k *3/286, 3/295, 3/33*

U.S. Cl. 307—279 **11 Claims**

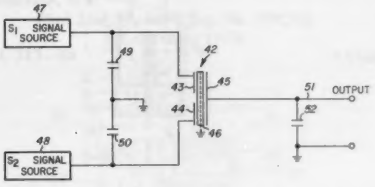


1. A hysteresis circuit comprising: an input means; an output means; first circuit means coupled to said input means and including a first switchable impedance means for generating control signals in response to input voltage levels; second circuit means including a second switchable impedance means for switching output voltage levels impressed on said output means in response to said control signals; voltage dividing circuit means connected between said input and output means; and third switchable impedance means connected in circuit with said first switchable impedance means for controlling input voltage levels switching output voltage levels in response to outputs from said voltage dividing circuit means; said third switchable impedance means is connected in series with said first switchable impedance means.

3,882,332
PIEZOELECTRIC PHASE DETECTOR

Edward M. Frymoyer, Santa Ana, Calif., assignor to Rockwell International Corporation, Dallas, Tex.

Filed Aug. 20, 1971, Ser. No. 173,434
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.1 **10 Claims**

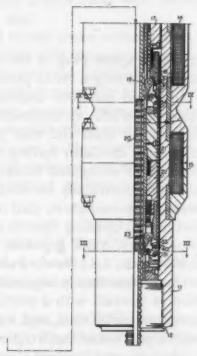


1. In a phase detector circuit unit using crystal filters, a phase detector section; first signal source means; second signal source means; first crystal filter means circuit connected to said first signal source means; second crystal filter means circuit connected to said second signal source means; said first and second crystal filter means having substantially identical phase characteristics and phase temperature behavior, piezoelectric material means common to and interconnecting said first and second crystal filter means; and signal combining electrode means on said piezoelectric material means circuit connected in said phase detector section.

3,882,333
FAIL SAFE LINEAR MOTION DEVICE

John L. DeWeese, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 17, 1973, Ser. No. 351,917
Int. Cl. H02k *41/02, 33/00*
U.S. Cl. 310—14 **9 Claims**

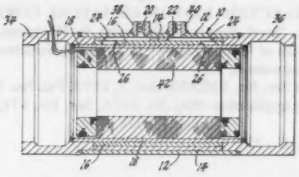


1. A linear motion device comprising an elongated linearly movable element, two axially spaced gripper means for engaging said linear element, electrically energized magnet coil means for activating said gripper means and for incrementally moving said linear element in a rectilinear manner in both longitudinal directions, and means for substantially maintaining the relative axial position of said linear element with respect to said linear motion device, said means including locking apparatus for maintaining engagement of at least one of said two gripper means with said linear element to prevent movement of said linear element in either longitudinal direction, said locking apparatus being activated when electrical power to said magnet coil means is interrupted.

3,882,334
FLUID COOLED DYNAMOELECTRIC MACHINE FRAME AND STATOR ASSEMBLY

William J. Newill, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1974, Ser. No. 440,667
Int. Cl. H02k *9/00*
U.S. Cl. 310—59 **2 Claims**

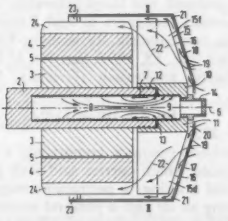


1. A cooling arrangement for a dynamoelectric machine comprising: a dynamoelectric machine frame including an inner cylindrical sleeve, a first intermediate cylindrical sleeve circumjacent the inner sleeve, a second intermediate cylindrical sleeve circumjacent the first intermediate sleeve and an outer cylindrical sleeve circumjacent the second intermediate sleeve, the outer sleeve having a fluid inlet port and a fluid outlet port, the first intermediate sleeve having a first pattern of openings therein and the second intermediate sleeve having a second pattern of openings therein overlapping respective ones of the openings in the first pattern and the inlet and outlet ports to define an interconnecting tortuous fluid path between the inlet and outlet ports; and a dynamoelectric machine stator assembled within the inner sleeve, the inner sleeve providing heat transfer between the stator and fluid circulated within the fluid path.

3,882,335
COOLING APPARATUS FOR THE ROTOR OF AN ELECTRIC MACHINE WHICH USES A HEAT PIPE

Paul Fries, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 18, 1973, Ser. No. 352,270
Claims priority, application Germany, Apr. 25, 1972, 2220266
Int. Cl. H02k *1/32*
U.S. Cl. 310—61 **3 Claims**



1. Apparatus for improved cooling in an electric machine in which the rotor shaft is hollow and contains a small amount of working fluid so that it acts as a heat pipe comprising:

a. a fan having a plurality of essentially rectangular radial vanes, said fan having a hub shaped to fit over the end of the hollow shaft and said fan inclusive its vanes and its hub being formed in a single piece of highly conductive material and said hub having a hollow portion of a diame-

ter equal to that of the hollow shaft to form an extension of the heat pipe, whereby the working fluid will be evaporated in the shaft portion of the heat pipe and will travel to the fan portion of the heat pipe where it will be condensed with heat being removed by the conductive effect of said hub and vanes and the air flowing thereover due to rotation of the fan,

b. at least two trapezoidal guide baffles between two different pairs of vanes of said fan; and

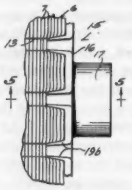
c. a hood, having a shape matching that of the fan, enclosing said fan.

3,882,336

ELECTRIC MOTOR ARMATURE CORE

Edward A. Boyd, Sussex, and Joseph R. Harkness, Germantown, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Division of Ser. No. 420,940, Dec. 3, 1973, Pat. No. 3,831,268.
This application May 20, 1974, Ser. No. 471,568
Int. Cl. H02k *1/06*
U.S. Cl. 310—216 **5 Claims**



1. An armature core comprising a stack of laminations assembled on a shaft, to form a laminated coil-carrying body the peripheral portion of which is defined by a circular row of T-shaped teeth, the heads of which are radially outermost so that said body has circumferentially spaced reentrant coil receiving slots formed by the spaces between the teeth and opening to its periphery through the spaces between the heads of the T-shaped teeth, and

said core being characterized in that the heads of the T-shaped teeth on a plurality of the endmost laminations at the axially opposite ends of said laminated body are progressively narrower towards the ends of the body.

3,882,337

HALL PLATE CONTACT-LESS OPERATOR AND METHOD OF ITS ADJUSTMENT

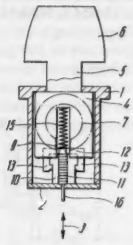
Josef Pfeffer, Amtszell, and Horst Schwable, both of Obermelsungen, Germany, assignors to Rafi Raimund Finsterholzl Elektrotechn. Spezialfabrik, Ravensburg-Vorberg, Germany

Filed Nov. 13, 1973, Ser. No. 415,335
Claims priority, application Germany, Nov. 17, 1972, 2256360
Int. Cl. H02k *35/02*
U.S. Cl. 310—273 **2 Claims**

1. A contact-less operator comprising: a housing, a Hall generator, a plate which carries said Hall generator and is disposed in said housing, a permanent magnet having pole surfaces defining an air gap, a pushrod member carrying said magnet and disposed in said housing, means for displacing said pushrod member from outside said housing, and a spring disposed in said housing and acting on said pushrod member to bias said pushrod member to a position in which said Hall generator is outside said air gap of said magnet, displacement of said pushrod member by said means bringing said magnet to a position in which said Hall generator is between said pole surfaces, wherein said magnet is in the interior of said pushrod member, and the displacing means comprises:

A. a pushrod integrally connected to said pushrod member, and

B. an operating button on said pushrod outside said housing,



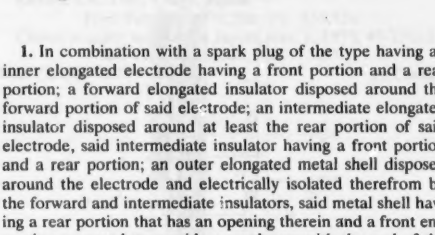
the operator further comprising a retaining loop bracket having a central portion and two resilient limb portions projecting therefrom provided with inwardly projecting portions which engage behind corresponding projections on holders extending inwardly from an end member of the housing, said plate being held between said central portion and said end member.

3,882,338

IGNITER PLUG

Helmut P. Meyer, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 16, 1974, Ser. No. 433,944
Int. Cl. H01t *13/20, 13/24*
U.S. Cl. 313—11.5 **8 Claims**



1. In combination with a spark plug of the type having an inner elongated electrode having a front portion and a rear portion; a forward elongated insulator disposed around the forward portion of said electrode; an intermediate elongated insulator disposed around at least the rear portion of said electrode, said intermediate insulator having a front portion and a rear portion; an outer elongated metal shell disposed around the electrode and electrically isolated therefrom by the forward and intermediate insulators, said metal shell having a rear portion that has an opening therein and a front end portion arranged to provide a spark gap with the end of the front portion of said electrode, said forward elongated insulator having its forward end immediately adjacent the spark gap, a first forward portion in contact with a portion of the front end of said outer elongated metal shell, and a second forward portion in contact with a portion of the front end of the inner elongated electrode whereby said forward elongated insulator extends adjacent said spark gap between said metal shell and inner electrode; and a metal sleeve having a front end portion that includes an opening that is in mated relationship with the rear portion of said intermediate insulator, the inside of said front end portion of said sleeve annularly fastened in pressure tight relationship to the outside rear portion of said intermediate insulator; and a rear end portion having a configuration that matches the opening in the rear of said metal shell, the rear end of said metal sleeve annularly fastened in pressure tight relationship to the rear end of said metal shell whereby said intermediate insulator and said shell are connected together by said sleeve, the improvement comprising:

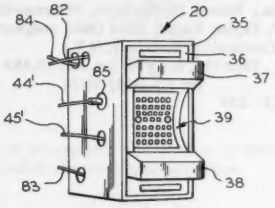
means for slidably mounting said forward insulator, including means for axially and resiliently biasing said forward insulator against said front end portion of said shell.

3,882,339

GRIDDED X-RAY TUBE GUN

Edward T. Rate, Jr., Mequon, and Robert F. Heiting, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed June 17, 1974, Ser. No. 479,746
Int. Cl. H01j *35/06*
U.S. Cl. 313—60 **8 Claims**



1. An X-ray generator comprising:

a. electron emission means having a substantial electron emission area,

b. first anode means spaced from said emission means for producing X-radiation when impinged upon by electrons from said emission means,

c. second anode means having an opening and being interposed between said emission means and said first anode means, said second anode means when at a positive potential relative to said emission means producing an electric field effective to converge electrons emitted in a path from said emission means into a beam for passing through said opening to impinge on said first anode means,

d. means for selecting the portion of said emission means from which electrons are withdrawn including first grid means nearest said emission means having a gridded area substantially coextensive with the entire electron emission area, and

e. other grid means more remote from said emission means than said first grid means, said other grid means having electrically isolated gridded areas adjacent each other and generally transverse to said beam path to enable biasing said isolated areas individually or jointly at a positive potential relative to said emission means and said first grid means to thereby withdraw electrons from portions of said emissive means corresponding substantially with said isolated gridded areas.

3,882,340

IMAGE INTENSIFIER TUBE

Wilhelm Richard Jonker, Vries, Netherlands, assignor to B.V. Delft Electronics producten a Dutch, Roden, Netherlands

Filed Nov. 30, 1973, Ser. No. 420,387
Claims priority, application Netherlands, Dec. 22, 1972, 7217628
Int. Cl. H01j *5/02, 31/26*
U.S. Cl. 313—94 **9 Claims**

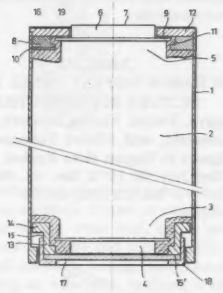
1. Image intensifier device comprising:

a housing of rigid synthetic resin plastic provided respectively at opposite ends with openings centered on a common axis, at least a first of said openings, located at a first end of said housing, being formed in a cover provided on the first end of said housing;

a unitary body coaxial with said axis composed of at least one image intensifier tube coaxial with said axis and coaxial optical windows at the axial ends of said body adjacent image intensifier tube end surfaces on which they are respectively affixed and also high voltage power supply means consisting of components all located off said axis, all of the foregoing components of said body being embedded and surrounded, except for end surfaces of said tube or tubes and of said optical windows, in a synthetic resin plastic, said opening in said cover clearing the adjacent optical window and the other of said openings clearing the adjacent end of said unitary body;

at least the intensifier tube end adjacent said cover having a flange;

a ring of rigid non-deformable material arranged to provide a rigid annular end surface of said unitary body for attachment to said cover, said ring having an internal flange



embedded in said embedding synthetic resin plastic and located axially inwardly of said flange of said intensifier tube end;

said ring being spaced from said tube end and its flange by an annular mass of said embedding plastic, whereby the positioning of said ring relative to said cover substantially fixes the position of said tube end and the optical window adjacent thereto relative to said cover, said ring being affixed to said cover, and

means near the end of said unitary body remote from said first end of said housing for supporting said unitary body transversely to said axis in said housing while freely permitting axial movement of said end of said body relative to said housing.

3,882,341

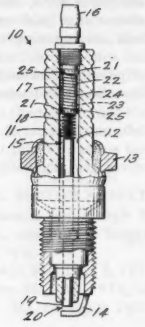
SPARK PLUG WITH INDUCTIVE SUPPRESSOR

Sam J. Green, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jan. 24, 1974, Ser. No. 436,079
Int. Cl. H01j *23/16;* **H01t** *13/04*
U.S. Cl. 313—134 **11 Claims**

1. A spark plug having a ceramic insulator with a central bore therein, a center electrode assembly within said bore, and a wire wound radio interference inductive suppressor

within such center electrode assembly, said suppressor comprising a core of ferromagnetic materials and a conductive



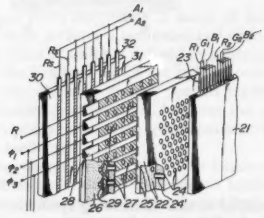
wire wound around said core and connected in series in such center electrode assembly.

3,882,342

GAS DISCHARGE DISPLAY PANEL FOR COLOR PICTURE REPRODUCTION

Takeo Kamegaya, Tokyo; Yutaka Imahori; Ryuichi Kaneko, both of Kawasaki, and Minori Yokozawa, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed July 30, 1974, Ser. No. 493,080
Int. Cl. H01j *61/06*
U.S. Cl. 313—188 **10 Claims**



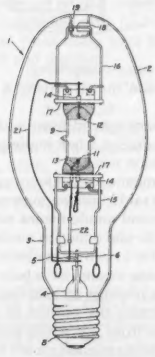
1. A gas discharge display panel comprising in combination;
a front panel formed by transparent insulating material,
a first intermediate insulating plate provided with a plurality of picture elements arranged in matrix shape, in which each picture element is formed by a set of three display discharge units for displaying three primary colors, red, green and blue, respectively, and each of the display discharge unit comprises a hollow display cathode,
a number of display anode stripes extended in parallel and provided between the front panel and the first intermediate insulating plate, in which the display anode stripes are formed in groups for respective primary colors and each stripe being provided at a location to establish registration with respective row of said display discharge units for reproducing corresponding primary color,
a second intermediate insulating plate provided with a plurality of hollow scanning cathodes, in which each hollow scanning cathode is provided at a position facing against said set of hollow display cathodes representing a picture element and each column of the hollow scanning cathodes are connected by a conductive stripe,
a rear panel made of insulating material, and
a plurality of scanning anodes provided in parallel on the rear panel in a direction normal to said conductive stripes,
wherein the set of the hollow display cathodes and the hollow scanning cathode are so arranged as to overlap at through holes having small cross-sectional area so that a scanning discharge produced between the scanning cathode and the scanning anode can easily be transferred to the hollow display cathode forming the display discharge unit together with the display anode in a manner that the scanning discharge will not give substantial influence to a viewer located at the front panel side.

3,882,343

TIN CHLORIDE MOLECULAR RADIATION LAMP

Dimitrios M. Speros, Painesville; Robert M. Caldwell, Richmond Hts.; Robert H. Springer, Warrensville Hts., and Robert P. Taylor, Euclid, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1970, Ser. No. 78,484
Int. Cl. H01j *61/18*
U.S. Cl. 313—229 **10 Claims**



1. A high intensity arc lamp comprising a light transmissive envelope of a material non-reactive with stannous chloride at an elevated temperature, refractory metal sealed into the ends thereof and a filling within said envelope comprising stannous chloride, stannous iodide and tin, a quantity of mercury which is substantially all vaporized during operation, and an inert gas to facilitate starting, the atom ratio of chlorine to iodine within said envelope being not in excess of approximately two and the maximum residual oxygen content being low enough to prevent excessive electrode attack by one oxyhalide transport cycle while permitting wall cleanup by another oxyhalide transport cycle.

3,882,344

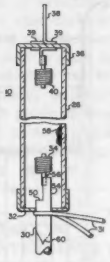
TUBULAR ELECTRODE SUPPORT FOR CERAMIC DISCHARGE LAMP

William J. Knochel, West Orange; Leo C. Werner, Cedar Grove, both of N.J., and Francis C. M. Lin, Flushing, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1974, Ser. No. 447,619
Int. Cl. H01j *1/94, 61/06*
U.S. Cl. 313—217 **9 Claims**

4. An improved refractory metal exhaust and fill tubulation for a ceramic discharge lamp, said tubulation comprising:
an elongated, thin walled tubular member having a notched out portion adjacent one end thereof and a collapsed wall portion extending from said notched out portion to said

adjacent end, said collapsed wall portion extending substantially curvilinearly with and adjacent to the inner



surface of its opposite wall portion to thereby form a double walled electrode holding portion.

3,882,345

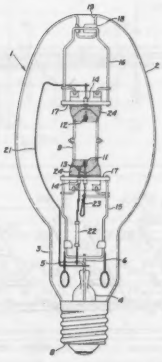
METAL HALIDE DISCHARGE LAMP CONTAINING TIN AND SODIUM HALIDES

Gregory J. Kazek, Eastlake, and Dimitrios M. Speros, Painesville, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 200,714, Nov. 22, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 414,807

Int. Cl. H01j *61/18*

U.S. Cl. 313—229 **6 Claims**



1. A high intensity discharge lamp exhibiting a substantially continuous spectrum in the visible range plus broadened sodium D line radiation comprising

a sealed elongated arc tube of light-transmitting material,

arc supporting electrodes mounted at opposite ends of said arc tube on inleads sealed therethrough,

and a discharge sustaining filling within said arc tube comprising per cubic centimeter of arc tube volume from 0.15 to 0.70 milligrams of $SnCl_2$, from **0.60** to **2.50** milligrams of SnI_2, at least 0.10 milligram of tin, from 2.0 to 6.0 mg of mercury, from 1.0×10^{-6} to 2.0×10^{-5} moles of one of sodium chloride, sodium bromide, sodium iodide and mixtures thereof, and a small quantity of an inert starting gas.

3,882,346

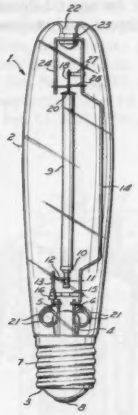
CERAMIC ARC TUBE MOUNTING STRUCTURE

Charles I. McVey, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 5, 1973, Ser. No. 412,659

Int. Cl. H01j *1/88, 19/42*

U.S. Cl. 313—253 **10 Claims**



1. A high intensity discharge lamp comprising:

an outer vitreous envelope domed at one end and having a base attached to the other end, and a pair of inleads sealed into said envelope and connected to said base;

a tubular ceramic envelope having electrodes sealed therein and containing an ionizable medium, a closure at the lower end of said envelope including a metal member serving as an inlead to the electrode, and a closure at the upper end of said envelope comprising a ceramic plug and a slender lead wire sealed therethrough;

an arc tube mounting frame within said envelope comprising one side rod extending from one inlead to the dome end of said envelope, and a short support rod extending from the other inlead, said metal member inlead being rigidly connected to one of said rods;

a transverse support member extending across from the other of said rods, said transverse support member being a smooth round wire making a single close-fitting loop around said slender lead wire, and a flexible conductor connecting said slender lead wire to said other rod.

3,882,347

COLOR STRIPE CATHODE RAY TUBE HAVING BRIDGED STRIP APERTURES

Takeshi Suzuki; Hiroshi Tanaka, and Makoto Kudo, all of Fukaya, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed May 29, 1973, Ser. No. 364,255

Claims priority, application Japan, May 30, 1972, 47-53034

Int. Cl. H01j *29/66, 29/32, 31/20*

U.S. Cl. 313—403 **3 Claims**

1. A color cathode ray tube comprising,

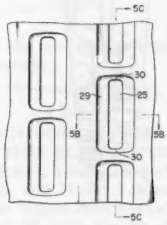
an envelope having a face plate,

a fluorescent screen formed on the inner surface of said face plate and including a plurality of elemental phosphor stripes

a shadow mask provided with a multiplicity of vertically elongated slit apertures and disposed in spaced relationship with respect to said fluorescent screen,

electron gun means for emitting electron beams through said apertures to said screen,

said slit apertures being vertically spaced apart by transverse bridge elements, each of said slit apertures having a first pair of vertical side walls and a second pair of lateral side walls for defining the throat of said slit aperture, said throat being the most constricted opening defined by said aperture, said second pair of side walls defining said transverse bridge elements, each of said side walls comprising a portion inclined with respect to the surface of said mask facing said fluorescent screen and terminating at said throat, said inclined portions of said



lateral side walls being so inclined as to locate the lateral portion of said throat substantially at the center of the thickness of said shadow mask between the surface of said mask facing said fluorescent screen and the surface thereof facing said guns at a longitudinal section taken on the longitudinal central axis of each said slit apertures of said mask, said inclined portions of said vertical side walls being inclined to locate the vertical portion of said throat substantially closer than said lateral portion of the throat to said surface of said mask facing said guns.

3,882,348

CATHODE-RAY TUBE WITH INTERNAL CYLINDRICAL RESISTOR BETWEEN HIGH VOLTAGE CONNECTION AND ELECTRON GUN

Cornelis Johannes Henricus Paridaens, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

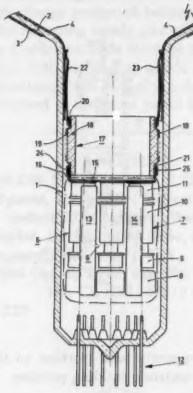
Filed Jan. 16, 1971, Ser. No. 433,803

Claims priority, application Netherlands, Feb. 21, 1973, 7302366

Int. Cl. H01j *29/96, 29/48*

U.S. Cl. 313—450 **2 Claims**

1. A cathode-ray tube comprising an evacuated envelope, means disposed within said envelope and including a final anode to produce at least one electron beam, an electrically conductive layer on an inner surface of the envelope, an electric resistor which connects the conductive layer to the final anode, said electric resistor being a mono-layer winding of resistance wire on the outside of on a mainly cylindrical hollow body spaced apart from said envelope and having an axis which is coaxial with the main axis of the tube, said cylin-



drical body being a material of a sufficiently low resistance to prevent surface charging.

3,882,349

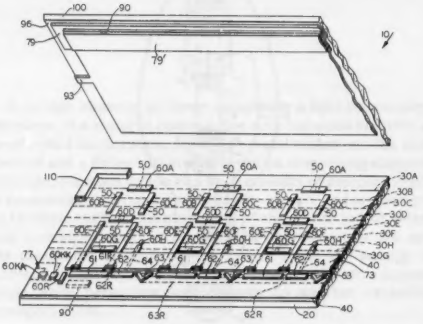
MULTI-POSITION, GASEOUS DISCHARGE, CHARACTER DISPLAY PANEL INCLUDING AUXILIARY, CATHODE TRANSFER ELECTRODES

George E. Holz, North Plainfield, and James A. Ogle, Neshanic Station, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed June 13, 1974, Ser. No. 478,916

Int. Cl. H01j *61/08, 61/66*

U.S. Cl. 313—519 **13 Claims**



1. A multi-position character display panel comprising

a gas-filled envelope consisting of a base plate and a face plate having a viewing window and containing,

a plurality of groups of display cathode electrodes adapted to be energized in different combinations to display characters, the cathodes in each group being so positioned that cathode glow can transfer readily from one cathode to an adjacent cathode in a selected sequence through the display cathodes of each group whereby each display cathode is in glowtransfer proximity to at least one other display cathode whereby every cathode of each group can be energized and caused to exhibit cathode glow,

an anode electrode in operative relation with each of said groups of display cathode electrodes, and

a plurality of groups of auxiliary cathode electrodes disposed adjacent to and between each group of display

cathode electrodes, said auxiliary cathode electrodes being disposed in series, with adjacent electrodes being close to each other so that cathode glow can transfer readily from one to another, said auxiliary electrodes also being positioned close to selected ones of said display cathode electrodes so that cathode glow can transfer readily from an auxiliary cathode electrode to at least one display cathode electrode in each said group of display cathodes whereby characters can be displayed by each group of display cathodes by means of cathode glow transferred along each group of auxiliary cathode electrodes and from each group of auxiliary cathode electrodes through each group of display cathode electrodes.

3,882,350

DYNAMIC CONVERGENCE CIRCUIT

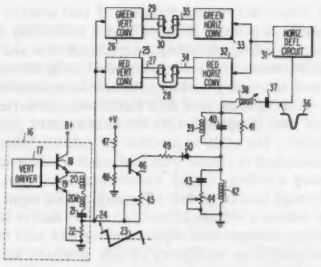
Cyril John Hall, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Sept. 26, 1973, Ser. No. 401,089

Claims priority, application United Kingdom, June 12, 1973, 27791/73

Int. Cl. H01j *29/50*

U.S. Cl. 315—13 C **7 Claims**



1. A dynamic convergence circuit comprising:

a first source of waveforms having a first frequency;

a convergence coil;

waveshaping means coupled to said first source and to said convergence coil for producing a desired convergence current waveform at said first frequency in said convergence coil;

a second source of waveforms having a second frequency;

means including an active current conducting device having an input electrode coupled to said second source; and

unidirectional conducting direct current coupling means for direct current coupling an output electrode of said device to said convergence coil through a single conduction path for amplitude modulating said first frequency convergence current in response to simultaneous conduction of said device and said unidirectional conducting means caused by said second source of waveforms.

3,882,351

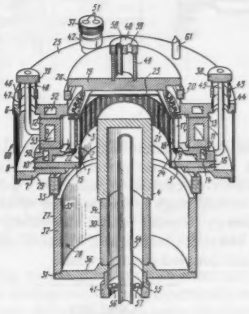
MICROWAVE ELECTRON TUBE

Vladimir Alexandrovich Ryabinin, Naberezhnaya reki Fontani, 33, kv. 103; Vladimir Ivanovich Sadofiev, prospekt Smirnova, 65, kv. 67; Igor Mikhailovich Mitin, Kolomenskaya ulitsa, 46, kv. 20; Kira Boleslavovna Yankevich, Shkolnaya ulitsa, 15, kv. 26; Evgeny Ivanovich Matrosov, ulitsa Fedoseenko, 25, kv. 63; Anton Felixovich Leliovsky, prospekt Smirnova, 27, korpus 2, kv. 90; Karl Romanovich Terra, Grazhdansky prospekt, 27, korpus 2, kv. 152, and Alexei Petrovich Kashirin, Grazhdansky prospekt, 108, korpus 1, kv. 36, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 278,013, Aug. 4, 1972, Pat. No. 3,805,111. This application Apr. 15, 1974, Ser. No. 461,236

Int. Cl. H01j *7/46, 19/80*

U.S. Cl. 315—39 **10 Claims**



1. A microwave electron tube comprising: a plurality of electrodes including at least a first electrode, a second electrode arranged opposite said first electrode and at least one grid arranged between said first and second electrodes; high-frequency leads for each of said electrodes; means for electrically coupling each of said electrodes to its high-frequency lead, at least one of said means coupling one of said electrodes being constructed in the form of a section of a microwave line; a first conductor of said section of the microwave line being connected at one end to said one electrode; a second conductor of said section of the microwave line being connected at one end to the high-frequency lead of said one electrode, the other ends of said first and second conductors being electrically shorted, said first and second conductors being constructed in the form of surface of revolution whose size is selected so that the impedance at said point of connection is inductive in character; means for feeding supply voltages to said electrodes, and an evacuated envelope means enclosing said electrodes and said section of the microwave line.

3,882,352

ELECTRICALLY TUNED MICROWAVE ENERGY DEVICE

John M. Osepchuk, Concord, and Theodore Kohane, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 27, 1974, Ser. No. 446,446

Int. Cl. H01j *25/50*

U.S. Cl. 315—39.55 **7 Claims**

1. A microwave energy device comprising:

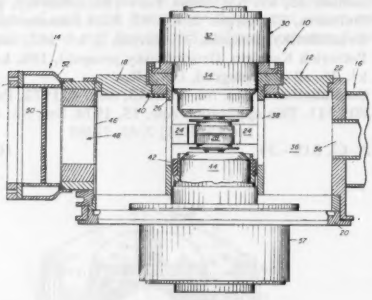
means for generating electromagnetic energy at a predetermined frequency including cavity resonator means;

coupled-circuit means for electrically tuning said device including a transmission line electrically coupled with said cavity resonator means;

said transmission line having mounted therein, in the order named, a circular polarizer for converting linear to circularly polarized wave energy, ferromagnetic phase-shifting

means, short circuit means enclosing an end to reflect substantially all of the circularly polarized energy incident thereon;

magnetic field producing means including a source of electric current positioned in the region of said phase-shifting means to provide said ferromagnetic material with an



internal magnetization field below the saturation magnetization value of said material and produce a variable phase shift of circularly polarized wave energy propagated therethrough in forward and reverse directions;

output energy coupling means electrically coupled to said cavity resonator means at a location separate and apart from said coupled-circuit means.

3,882,353

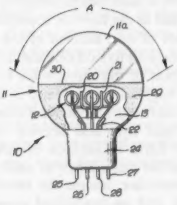
MULTICOLOR LIGHT SOURCE

Donald M. Ackley, 1115 17th St., Hermosa Beach, Calif. 90254

Filed Mar. 28, 1973, Ser. No. 345,765

Int. Cl. H01j *19/78, 61/40;* **H01k** *1/26*

U.S. Cl. 315—68 **9 Claims**



1. In a colored light source, the combination comprising

a. an envelope having a translucent portion,

b. at least two filaments located within the interior of the envelope so that said translucent portion subtends a substantial angle the apex of which is proximate the filaments,

c. a light transmitting glass enclosure extending at least part way about each filament and characterized in that light of different colors is transmitted through the respective enclosures when the associated filaments are electrically energized to incandescence, said enclosures contained within the envelope,

d. each enclosure having a generally cylindrically curved surface with direct and unobstructed exposure to said translucent portion of the envelope,

e. first light masking means in alignment with opposite ends of the enclosures to block escape through the envelope of light traveling axially endwise from said enclosures, and

f. second light masking means extending between the enclosures to block light transmission directly therebetween, thereby to prevent interference effects.

3,882,354

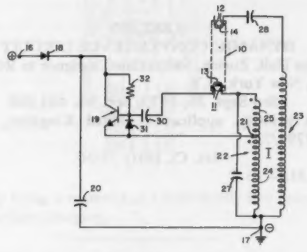
INVERTER BALLAST CIRCUIT FOR FLUORESCENT LAMP

Randall L. May, Andover, Kans., assignor to The Coleman Company, Wichita, Kans.

Filed July 23, 1973, Ser. No. 381,858

Int. Cl. H05b *41/29, 41/392*

U.S. Cl. 315—101 **2 Claims**



1. An inverter ballast circuit for energizing a fluorescent lamp from a source of direct voltage comprising: a transistor having a collector, an emitter and a base terminal, said collector being connected to one terminal of said source; a transformer having a primary winding and a secondary winding, said primary winding including an input section and a feedback section; means for connecting said lamp between said primary and secondary winding; means for connecting said feedback winding section of said transformer in series with a filament of said lamp and with the base-emitter junction of said transistor, the emitter junction of said transistor being further connected in circuit with said input winding section of said primary winding of said transformer such that current flowing through said transistor will energize said input winding section to induce a voltage in said secondary and in said feedback winding section, said input winding and said transistor being arranged in an oscillatory circuit, whereby as the current in said input winding section increases, said filament will limit the input current to said transistor, said filament being characterized as being a substantially constant current element over its operating range, thereby to control the output voltage of said transistor.

3,882,355

FLAT SCREEN DISPLAY DEVICE USING CONTROLLED COLD CATHODES

David De Witt, Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,587

Int. Cl. H05b *41/00*

U.S. Cl. 315—169 TV **14 Claims**

1. A display device comprising:

an electcrically conductive phosphor coating on a transparent screen,

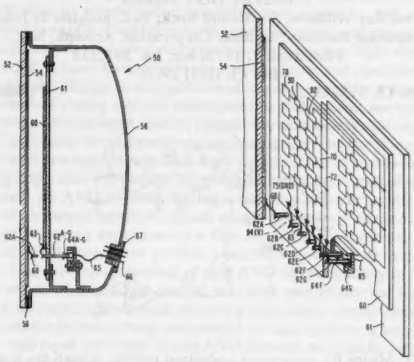
a semiconductor integrated circuit panel element in close parallel relation to said screen having embodied

1. a matrix array of surface regions facing said phosphor coating, each of said surface regions being one electrode of a diode capable of cold emission of electrons into a vacuum when electrically biased.

2. a plurality of control devices, each of which is connected to control the electrical bias of an associated surface region of said matrix,

3. storage circuitry having a plurality of storage elements, each storage element being arranged to be capable of continuously activating as associated control device,

means for translating externally applied digital signals to establish the desired state of each of said storage elements,



means to maintain an electric potential between said screen and said panel element, and

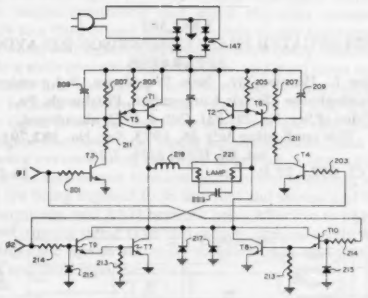
means for maintaining a vacuum at least in the space between said screen and said panel.

3,882,356

LEVEL SHIFTER TRANSISTOR FOR A FLUORESCENT LAMP BALLAST SYSTEM

Robert A. Stehlin, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1973, Ser. No. 426,734
Int. Cl. H05b *41/30*; **H05b** *41/39*
U.S. Cl. 315—205 **6 Claims**



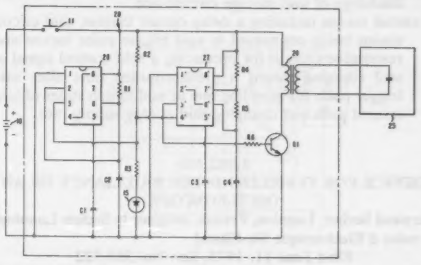
1. In a solid-state ballast system for a fluorescent lamp wherein first and second switching transistors are connected in series across the output of a full wave rectifier, with the connection between said transistors being provided to the lamp, and wherein only one of said transistors is ever on at one time, the switching of said transistors being controlled by logic circuits, which logic circuits are only capable of withstanding a low voltage, means to provide isolation between the logic circuits and said transistors comprising: a level shifter transistor having its emitter grounded and its collector output coupled as a control input to said transistors with the output of one of said logic circuits being coupled to the base of said level shifter transistor.

3,882,357

BATTERY OPERATED ELECTROLUMINESCENT FILM IDENTIFICATION DEVICE

Gerrit Nieuweboer, Claymont, and Martin A. Apostolico, Wilmington, both of Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 27, 1974, Ser. No. 446,535
Int. Cl. H05b *41/36*
U.S. Cl. 315—209 R **5 Claims**



1. Apparatus for electrically exciting an electroluminescent material, comprising:

a d.c. storage means for providing a d.c. voltage to a first and second timing means and a transformer,

a means for electrically connecting said d.c. storage means to said first and second timing means and said transformer,

said first timing means generating an electrical gate pulse, said second timing means being electrically responsive to said gate pulse and generating a series of electrical pulses, said electrical pulses occurring during the duration of said gate pulse, said second timing means being further electrically responsive to termination of said gate pulse and terminating said series of pulses,

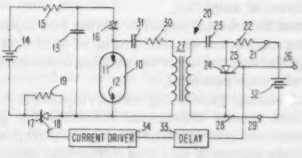
said transformer being electrically coupled to said second timing means and developing a voltage in response to each pulse of said series of pulses, said transformer being further electrically coupled to said electroluminescent material and applying said voltage to said electroluminescent material, said transformer, upon termination of each pulse, expending substantially all energy therein to said electroluminescent material as an oppositely polarized pulse.

3,882,358

ANTI-HOLDOVER CHARGING CIRCUIT FOR FLASH LAMP

Stephen Deskevich, Endwell; James C. Peacock, Endicott; Richard F. Tynan, Endwell, and Alan D. Wilson, Apalachin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

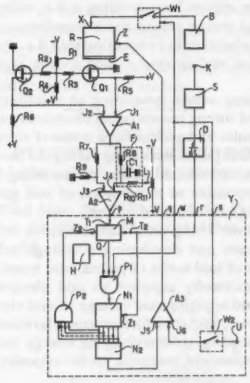
Filed June 26, 1973, Ser. No. 373,848
Int. Cl. H05b *37/00*
U.S. Cl. 315—241 P **4 Claims**



1. A circuit for permitting high frequency repetition of a flash lamp comprising:

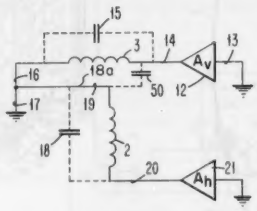
an energy storage circuit connected to said lamp;
direct current charging means connected to said storage circuit, said charging means including a first constant impedance path and a second path with switch means having an on-state and an off-state in parallel with said first path to vary the rate of energy supplied to said storage circuit, said second path switch states being selectable in response to a control signal;
trigger pulse means for initiating flashing of said lamp and discharge of said storage circuit; and
circuit means including a delay circuit therein, said circuit means being connected to said trigger pulse means and responsive thereto for producing a said control signal at said charging means a predetermined time after said trigger pulse for selecting one of said switch states of said second path and changing said energy supply rate.

3,882,359
DEVICE FOR STABILIZING THE BRILLIANCY OF AN OSCILLOSCOPE
Fernand Secher, Lannion, France, assignor to Societe Lannionnaise d'Electronique Sle-Citerel
Filed June 11, 1973, Ser. No. 368,522
Claims priority, application France, June 9, 1972, 72.20842
Int. Cl. H01j *29/70*
U.S. Cl. 315—383 **6 Claims**



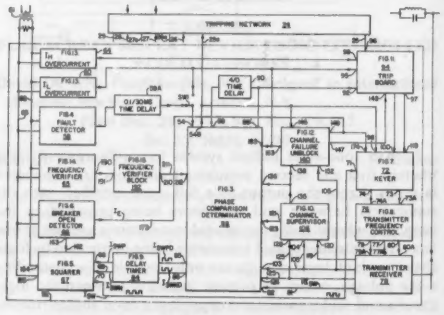
1. A device for the stabilization of the brightness of a display device, including a cathode ray tube having a brightness control input and a screen, a time base means for controlling the timing of operation of said cathode ray tube, comprising
a first differential amplifier having two inputs,
a first photo-transistor disposed before the screen of said cathode ray tube so as to receive illumination therefrom and being connected to one input of said first differential amplifier,
a second photo-transistor disposed at a position isolated from the illumination of the screen of said cathode ray tube and being connected to a second input of said first differential amplifier,
a second differential amplifier having two inputs, one input being connected to the output of said first differential amplifier and the other input being connected to a source of reference potential,
control voltage generating means responsive to the output of said second differential amplifier for generating a control voltage which increases in a step-wise manner until the output of said first differential amplifier reaches the level of said reference potential as indicated by the output of said second differential amplifier, and
an adder amplifier having one input connected to the output of said control voltage generating means and another input connected to a source of video signals, the output of said adder amplifier being connected to said brightness control input of said cathode ray tube.

3,882,360
CROSSTALK SUPPRESSOR FOR MAGNETIC DEFLECTION YOKES
Errol Ray Williams, Jr., Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 7, 1973, Ser. No. 395,332
Int. Cl. H01j *29/70*
U.S. Cl. 315—395 **8 Claims**



1. Means for preventing undesired ringing in both the horizontal and vertical sections of a magnetic deflection yoke comprising:
a fast retrace winding;
a high frequency voltage source connected to said fast retrace winding;
a low frequency trace winding capactively coupled to said fast retrace winding such that during retrace time a common mode current path is established which allows common mode current to flow through both of said windings such that said common mode current causes undesired ringing therein;
a low frequency current source providing current through said low frequency trace winding;
a transformer connected in said common mode current path having means associated therewith to damp said undesired ringing in both said trace and retrace windings.

3,882,361
SEGREGATED PHASE COMPARISON RELAYING APPARATUS
Walter L. Hinman, Jr., New Providence, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Division of Ser. No. 295,031, Oct. 4, 1972, abandoned.
This application July 26, 1973, Ser. No. 382,791
Int. Cl. H02h *3/26, 7/26*
U.S. Cl. 317—27 R **16 Claims**



1. In a phase comparison unblocking relaying apparatus, a receiving apparatus, said receiving apparatus normally maintaining a first pair of normal logic signal outputs whenever a

normal non-fault signal is being received by said receiving apparatus, a first comparing network having a plurality of input terminals and an output terminal, means interconnecting a first of said input terminals of said comparing network to said receiving apparatus for energization by one of said first normal logic signal outputs, said receiving apparatus being effective to supply a first operating logic signal to said first input terminal of said comparing network when said receiving apparatus is receiving said one non-fault normal logic signal output, a timer having an input and an output and operable to delay the change in energization of its said output for a predetermined timing interval subsequent to a change in energization of its said input, means operatively connecting said input of said timer to said receiving apparatus whereby the removal of said one normal non-fault logic signal output of said receiving apparatus will change the energization of said input of said timer, an AND network having a plurality of input terminals and an output terminal, circuit means operatively connecting said receiving apparatus to a first of said input terminals of said AND network to provide a second operating logic signal to said first input terminal of said AND network solely in the absence of a selected one of said first pair of normal logic signal outputs from said receiving apparatus, circuit means operatively connecting said output of said timer to a second of said input terminals of said AND network to provide a third operating logic signal to said second input terminal of said AND network solely prior to the timing out of said timer, a fault detector having an output terminal connected to a third of said input terminals of said AND network and to a second of said input terminals of said comparing network, said fault detector being effective to supply fourth and fifth operating logic signals to said third input terminal of said AND network and said second input terminal of said comparing network respectively solely as a consequence of the operation of said fault detector in response to a fault, said receiving apparatus being effective to provide a second output signal which changes in character in response to changes in the character of said transmitted fault signal, a local signal supplying means having a local signal which changes in character, a signal character comparing network connected to be energized by said second output signal provided by said receiving apparatus and by said local signal provided by said local signal supplying means, means connecting said signal character comparing network to a third of said input terminals of said first comparing network, said signal comparing network being effective to provide a sixth operating logic signal to said third input terminal of said first comparing network solely at first predetermined relative relations of said characters of said second output signal from said receiving apparatus and said normal local signal from said local signal supplying means, said first comparing network being effective to provide a first tripping signal at its said output terminal solely when operating logic signals are being supplied to its said first and second and third input terminals, said AND network being effective to provide a second tripping signal at its said output terminal solely when operating logic signals are being supplied to its said first and second and third input terminals.

3,882,362

DEVICE FOR PREVENTING OSCILLATION OF LRC CIRCUIT

Sakuji Watanabe, Urawa, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

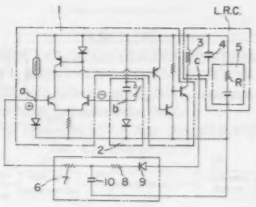
Filed Nov. 26, 1973, Ser. No. 419,044

Claims priority, application Japan, Nov. 30, 1972, 47-119377

Int. Cl. H01f *7/18*

U.S. Cl. 317—123 **5 Claims**

1. In an improved shutter control circuit for an electronic shutter device including an electromagnet for energization to hold open a shutter curtain, a drive circuit for the electromagnet, a capacitor disposed in parallel circuit relation with the electromagnet for preventing high frequency noise from interfering with the operation of the electromagnet, a control circuit having an input and having an output connected to the drive circuit for generating first and second output signals for respectively energizing and deenergizing the electromagnet, and a battery power source connected to the electromagnet, the drive circuit and the control circuit, the improvement comprising:



positive feedback circuit means coupled between a junction of the electromagnet-capacitor circuit and an input to the control circuit, said positive feedback circuit including means for sensing the commencement of deenergization of the electromagnet and for developing a feedback voltage in response thereto for application to said control circuit for increasing said second output signal of the control circuit.

3,882,363

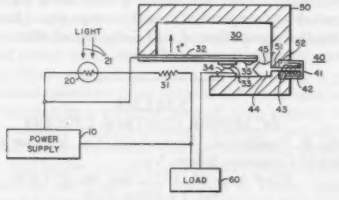
PHOTOCONTROL WITH AUTOMATIC LIGHT OPERATED RESET

John J. Misencik, Shelton, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,861

Int. Cl. H01h *47/24*

U.S. Cl. 317—124 **7 Claims**

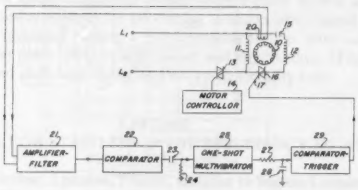


1. A photocontrol comprising:
a photosensitive device which passes current when excited by a predetermined light level;
a heat generator which is energized by said photosensitive device;
a bimetal member which moves in response to heat received from said heat generator;
a pair of electrical contacts, one of said contacts being carried by said bimetal member, said contact carried by said bimetal member being moved when light received by said photosensitive device falls below a predetermined level to engage said other electrical contact to close an electrical circuit including a power source and moves when light received by said photosensitive device rises above a predetermined level to disengage said other electrical contact to open said electrical circuit; and
means for locking said pair of contacts in circuit open position, said means being actuated by a predetermined light level to permit said contacts to move to circuit closed position.

3,882,364
INDUCTION MOTOR CONTROL SYSTEM

Floyd H. Wright, and David M. Erdman, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 281,757, Aug. 18, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,996
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 R **18 Claims**



1. A control system for an induction motor with at least a pair of poles and a multi-toothed rotor and having a first winding and a second winding, comprising:

means for energizing said first winding from an alternating-current source;

a bidirectional switch for connecting the source to the second winding in response to a firing signal;

means for sensing an operating characteristic of said motor and developing a control signal in response to flux variations effected by the teeth in said rotor, the control signal including a ripple frequency corresponding to movement of slots between said teeth past one of said poles;

filter means for removing from said control signal components having frequencies of the alternating current;

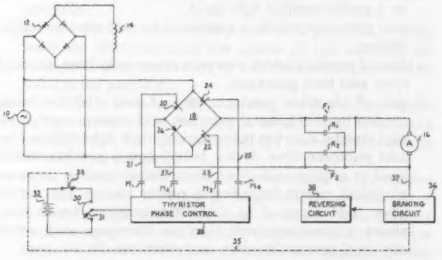
regulating means responsive to the filtered control signal for developing an average signal that is proportional to said ripple frequency and that is also proportional to the speed of said rotor, said regulating means including a comparator responsive to said filtered control signal for developing a control voltage representative of the ripple frequency;

and trigger means for applying said firing signal to said switch and responsive to said average signal for terminating the application of said firing signal when said speed reaches a predetermined value.

3,882,365
DC MOTOR CONTROL CIRCUIT

Charles R. Yemington, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed June 18, 1973, Ser. No. 371,270
Int. Cl. H02p *3/10*
U.S. Cl. 318—269 **14 Claims**



1. A control circuit for a direct current motor including an armature and operable from a source of alternating current power comprising:

a. a full wave rectification bridge circuit for applying rectified power from said source to said motor, said bridge circuit including a controlled rectifier in each leg thereof;

b. means for phase controlling the rectifiers of said bridge circuit to vary the effective power applied to said motor;

c. reversing circuit means for selectively determining the direction of power application to said motor whereby the direction of armature rotation may be changed; and

d. selectively operable braking circuit means for stoping the rotation of said armature including,

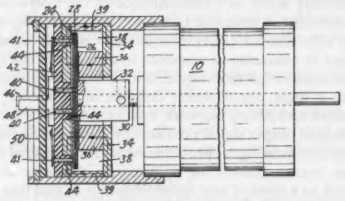
i. direction sensing means for determining the direction of armature rotation, and

ii. means responsive to said direction sensing means and associated with said reversing sensing means for controlling said bridge circuit to apply power to said motor in a direction opposite to that to drive the motor in the then existing direction of rotation.

3,882,366
MOTOR SPEED CONTROL SYSTEM

Kenneth Clunis, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 234,255, March 13, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,816
Int. Cl. H02p *5/00;* **H02k** *17/44*
U.S. Cl. 318—326 **10 Claims**



1. A servo system that provides precise motor speed control of a bi-directional motor and comprises:

a control means for furnishing an electrical drive signal to said motor;

a differential means for providing an error signal to said control means; and

a homopolar generator serving as a tachometer for providing a signal indicative of the speed and rotation of the motor to said differential means and having:

means for providing a unipolar magnetic field;

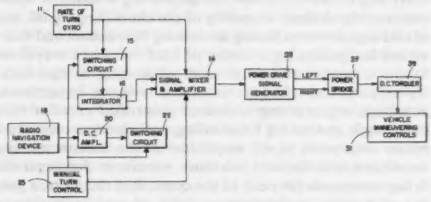
a conductor coupled to the shaft of the motor for rotation in said magnetic field to uniformly intersect said field at all rotational positions; and

at least two pair of stationary brushes for providing a signal to said differential means, which brushes include an outer pair electrically contacting the outside portion of one side of said conductor and an inner pair electrically contacting the inside portion of the same one side of said conductor, and the brushes of said outer pair are electrically connected together and the brushes of said inner pair are electrically connected together but one of the brushes from each pair is disposed to contact said conductor at a position radially opposite from the other brush of the pair in order that the output signal provided by said generator is substantially ripple free.

3,882,367
PULSE-WIDTH MODULATED SERVO TORQUER CONTROL WHEREBY POWER DRAIN IS MINIMUM AT NULL

Gerald F. Dulin, Torrance, Calif., assignor to Astronautics Corporation of America, Milwaukee, Wis.

Filed Apr. 24, 1972, Ser. No. 246,993
Int. Cl. G05b *11/28*
U.S. Cl. 318—599 **14 Claims**



1. In an autopilot system for controlling the maneuvering of a vehicle, said system including means for generating a control signal in accordance with a desired yaw attitude of said vehicle, the improvement comprising:

power drive signal generator means for generating electrical power drive in response to said control signal, said power drive signal generator means including first means for generating a first train of DC pulses having a width in accordance with yaw control signals representing yaw in a first direction and second means for generating a second train of DC pulses having a width in accordance with yaw control signals representing yaw in a second direction opposite to said first direction, said first generating means being in an off condition whenever the control signals are zero or represent yaw in the second direction, said second generating means being in an off condition whenever the control signals are zero or represent yaw in the first direction,

power bridge means for receiving said pulse trains,

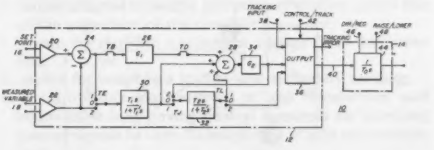
vehicle maneuvering controls, and

DC torquer means for receiving the output of said power bridge means for driving said vehicle maneuvering controls, said DC torquer means being connected to said power bridge means to receive DC current in one direction in response to said first train of pulses, and DC current in the direction opposite to said one direction in response to said second train of pulses.

3,882,368
APPARATUS AND METHOD FOR AUTOMATIC OR MANUAL PROCESS CONTROL

James T. Carleton, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 14, 1972, Ser. No. 271,857
Int. Cl. G05b *11/42*
U.S. Cl. 318—610 **16 Claims**



1. A process control system including:

measurement means for generating a feedback signal representative of a selected process variable,

set point means for generating a signal representative of a desired value of the measured variable,

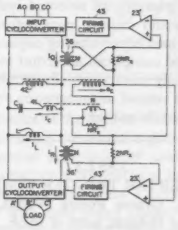
controller means for generating a control signal from the feedback signal and the set point signal, said controller being operative to apply selected control action including at least one form of control action other than integral action to the feedback signal and only integral action to set point signal, and

a final control element responsive to the control signal to modify the process so as to drive the measured variable toward the set point value.

3,882,369
CONTROL OF CYCLOCONVERTER SYSTEMS HAVING A PARALLEL RESONANT COMMUTATION CIRCUIT

William McMurray, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,490
Int. Cl. H02m *5/16*
U.S. Cl. 321—6 **20 Claims**



1. A cascaded power converter system comprising

a first power converter circuit and a second phase controlled converter power circuit each having a plurality of controlled power devices that are rendered conductive in sequence at a variable frequency to produce a desired output,

parallel resonant commutation circuit means connected in a link between said first and second converter circuits and including commutation instance means and parallel commutating capacitor means for supplying a variable amount of reactive power to selectively render said controlled power devices nonconductive, and

a firing circuit comprising means for generating a phase controlled converter firing angle retard limit signal which is comprised by a constant turn-off time control circuit for computing an approximately constant turn-off time for said power converter circuit controlled power devices, and further includes additional control circuitry for computing added time for turn-off to obtain approximately simultaneous turn-off of a selected first and second power circuit controlled power device.

3,882,370
CONTROL OF POWER CONVERTERS HAVING A PARALLEL RESONANT COMMUTATION CIRCUIT

William McMurray, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

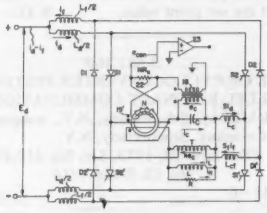
Filed Nov. 15, 1973, Ser. No. 416,006
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 R **23 Claims**

21. An efficient power converter comprising

a variable operating frequency power converter circuit having a plurality of controlled power devices that are sequentially rendered conductive at a variable frequency, a parallel resonant commutation circuit including commutating inductance means and parallel commutating capacitor means for supplying a variable amount of reactive power to render said controlled power devices nonconductive, and

constant turn-off time control means for computing the timing of and generating firing signals to provide an approximately constant turn-off time for said controlled power devices at each operating frequency,

said constant turn-off time control means comprising sensing means for continuously and simultaneously sensing at



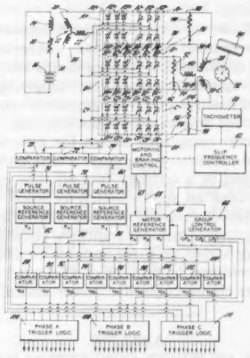
each instant a plurality of selected instantaneous power circuit voltage and current parameters from which the future state of said commutating capacitor means can be determined, and computation cirduit means for cyclically and continuously computing the timing of each firing signal from the sensed instantaneous voltage and current parameters at each instant.

3,882,371

CYCLOCONVERTER TRIGGER TIMING SYSTEM

Daniel W. Shimer, Grosse Pointe Woods, and Michael F. Matouka, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1974, Ser. No. 458,561
Int. Cl. H02m *5/44;* **H02p** *5/40*
U.S. Cl. 321—61 **3 Claims**



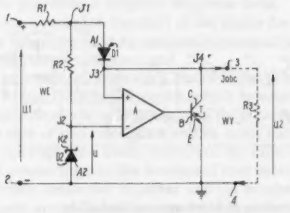
1. A system for supplying an alternating signal at a desired frequency to a load comprising: a polyphase voltage generator for generating polyphase line-to-neutral voltages; a converter coupled between the voltage generator and the load including a pair of polyphase full wave bridge rectifiers, one of said pair of bridge rectifiers including a first set of controlled rectifiers poled for supplying positive current to the load and a second set of controlled rectifiers poled for returning said positive current to the voltage generator and the other of said pair of bridge rectifiers including a third set of controlled rectifiers poled for supplying negative current to the load and a fourth set of controlled rectifiers poled for returning said negative current to the voltage generator; means for generating a number of waveforms each having alternating states, each state representing the firing angle range of a respective controlled rectifier in each fullwave bridge rectifier; means for generating a number of source reference waveforms each having an instantaneous amplitude representing the firing delay angle of a respective controlled rectifier in each full-wave bridge rectifier and having a fast falling trailing edge, the state of the waveform representing the firing angle range of one of the controlled rectifiers coinciding with the source reference waveform whose instantaneous amplitude represents the firing delay angle thereof; means for generating a series of square waves at the desired frequency of the alternating signal, each of said square waves having alternating first and second states; means for generating a series of load reference waveforms having a period coincident with each state of the square waves, each load reference waveform having an instantaneous amplitude representing a desired controlled rectifier firing delay angle and having a fast falling trailing edge; comparator means responsive to the amplitudes of the source reference waveforms and the load reference waveforms for generating firing commands for each of the controlled rectifiers; a number of bistable multivibrators, each of said multivibrators having an output coupled to a respective one of the controlled rectifiers in the pair of full wave bridge rectifiers; means for selectively setting the multivibrators coupled to the controlled rectifiers in the first and second sets to selectively gate said controlled rectifiers into conduction, each one of said last mentioned multivibrators being set upon the simultaneous occurrence of the first state of the square wave signal, the state of the waveform representing the firing angle range of the controlled rectifier coupled thereto and the firing command for the controlled rectifier coupled thereto; means for selectively setting the multivibrators coupled to the controlled rectifiers in the third and fourth sets to selectively gate said controlled rectifiers into conduction, each one of said last mentioned multivibrators being set upon the simultaneous occurrence of the second state of the square wave signal, the state of the waveform representing the firing angle range of the controlled rectifier coupled thereto and the firing command for the controlled rectifier coupled thereto; and means for resetting each multivibrator coupled to a contr· lled rectifier in a respective one of the first, second, third and fourth sets upon the setting of another one of the multivibrators coupled to a controlled rectifier in the same set, whereby the controlled rectifiers in the pair of full wave bridge rectifiers are selectively gated into conduction to supply the alternating signal at the desired frequency to the load.

3,882,372

PARALLEL VOLTAGE REGULATOR

Wieslaw Martynow, ul. Grojecka 102/149; Stanislaw Wilkowski, ul. Grojecka 102/33, and Wojciech Michalowski, ul. Chlodna 41/74, all of Warsaw, Poland

Filed Sept. 26, 1973, Ser. No. 401,108
Claims priority, application Poland, Oct. 2, 1972, 158039
Int. Cl. G05f *1/60*
U.S. Cl. 323—8 **2 Claims**



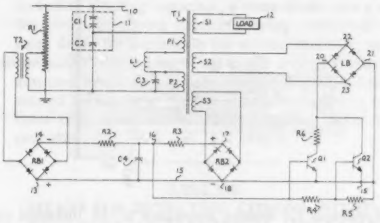
1. A parallel voltage regulator having an improved factor of stabilization, said regulator being adapted for use in battery-type measuring instruments, said regulator comprising first

and second output terminals, a differential amplifier including first and second inputs and an output, an n-p-n type regulating transistor, a Zener diode including a cathode and anode, a semi-conducting diode including a cathode and anode, and resistors each including first and second terminals, the first terminal of the first resistor being connected with said first input terminal, the second terminal of the said first resistor being connected with the first terminal of said second resistor, the second terminal of the said second resistor being connected with the cathode of said Zener diode and with the first input of said differential amplifier, a regulating transistor including a base, collector and emitter, the second input of the said differential amplifier being connected with the collector of said regulating transistor and with said first output terminal, the output of the said differential amplifier being connected with the base of the said regulating transistor, and a point at which appears a reference potential of the system, the second input terminal, the anode of Zener diode, the emitter of the said regulating transistor, and said second output terminal being connected with the point of the reference potential of the system, the anode of the semi-conducting diode being connected with the junction between the first resistor and the second resistor, the cathode of the said semi-conducting diode being connected with the second input of said differential amplifier whereby the Zener diode is supplied, through the second resistor with an output voltage increased by the value of voltage drop across the semi-conducting diode, the sum of the current of a load and of the regulating diode flowing through the said semi-conducting diode.

3,882,373
CONTROL DEVICE FOR POWER LINE VOLTAGE MEASURING CIRCUIT

Theodore Brenig, Lynchburg, Va., assignor to General Electric Company

Filed May 6, 1974, Ser. No. 467,103
Int. Cl. G05f *1/56, 1/64*
U.S. Cl. 323—66 **7 Claims**

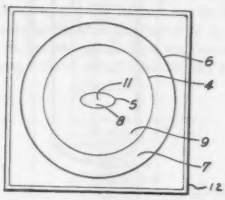


1. In a power line measuring system having a coupling capacitor, an improved control circuit comprising:
   a. a load transformer having a primary winding and a secondary winding coupled thereto;
   b. means adapted to couple said primary winding across one of the capacitors of the coupling capacitor;
   c. means for deriving a reference voltage from the power line;
   d. means for coupling a load to said secondary winding;
   e. a controllable load coupled to said transformer, said controllable load having control terminals for receiving control signals to vary the magnitude of said controllable load;
   f. means coupled to said transformer for deriving a load voltage therefrom;
   g. means for comparing said reference voltage and said load voltage and producing a control signal having a magnitude that varies as a function of the relative magnitudes of said load voltage and said reference voltage;
   h. and means coupling said control signal to said control terminals of said controllable load for changing said load as a function of said control signal magnitude.

3,882,374
TRANSMITTING-RECEIVING COIL CONFIGURATION

Alden W. McDaniel, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 18, 1974, Ser. No. 462,159
Int. Cl. G01v *3/10*
U.S. Cl. 324—3 **1 Claim**



1. In a metal detector of the type in which a transmitting coil is excited with alternating current of a given phase to generate electromagnetic waves and those of said waves which are reflected off metal induce a current in at least a receiving coil of said detector, which current has a component which is in phase quadrature with said given phase, the improvements comprising, said transmitting coil being of a first diameter, a first receiving coil being concentric and co-planar with said transmitting coil and being of a greater diameter than said transmitting coil, a second receiving coil being co-planar with said first receiving coil and being connected in series opposition therewith, said second receiving coil being of a smaller diameter than said transmitting coil and having a cross section of elliptical shape, each of said coils bounding an area, the difference between the area bounded by said first receiving coil and that bounded by said transmitting coil added to the area bounded by said second receiving coil being equal to the difference between the area bounded by said transmitting coil and that bounded by said second receiving coil, initial balance between said transmitting and receiving coils having been effected by adjusting the diameter of said transmitting coil and final balance having been effected by varying the number of turns on said second receiving coil.

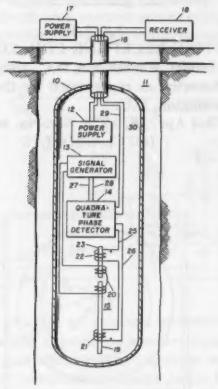
3,882,375
ELECTROMAGNETIC WELL LOGGING SYSTEM HAVING RECEIVER AND NULLING COILS MOUNTED ON SEPARATE MAGNETIC CORES

Joseph Zemanek, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,129
Int. Cl. G01v *3/18, 3/10*
U.S. Cl. 324—6 **7 Claims**

1. Apparatus for electromagnetically logging the earth formation surrounding a borehole, including:
   a. a pair of coaxially supported magnetic cores,
   b. a transmitter coil mounted partly on each of said magnetic cores,
   c. means for providing alternating current to said transmitter coil to thereby cause an alternating magnetic field in the earth formation surrounding the borehole,
   d. a receiver coil mounted on one of said magnetic cores in coaxial-spaced relationship with said transmitter coil,
   e. a nulling coil connected in series opposition to said receiver coil and mounted on the other of said magnetic cores in such a position that the total induced voltage across the nulling and receiver coils caused by said alter-

nating magnetic field is indicative of the magnetic susceptibility and electrical conductivity of the earth formation, and



f. said magnetic cores being of similar low-reluctance material whereby said induced voltage across the nulling and receiver coils is not affected by temperature variations throughout the length of the borehole.

3,882,376

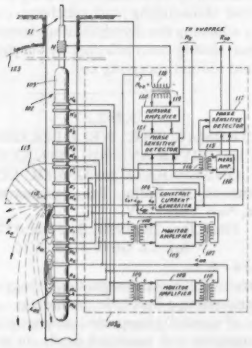
METHODS AND APPARATUS FOR INVESTIGATING EARTH FORMATIONS

Nick A. Schuster, Darien, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 247,197, April 24, 1972, abandoned, which is a division of Ser. No. 815,265, April 7, 1969, abandoned. This application Dec. 20, 1973, Ser. No. 426,549

Int. Cl. G01v *3/18*

U.S. Cl. 324—10 **11 Claims**



1. Apparatus for measuring a characteristic of earth formations traversed by a borehole, comprising:

a plurality of electrodes including at least one current-emitting electrode, a first pair of measuring electrodes, a first return electrode located between said at least one current-emitting electrode and said first pair of measuring electrodes, a second pair of measuring electrodes, a second current-emitting electrode located between said first and second pairs of measuring electrodes and a second current return electrode located between said second current-emitting electrode and said second pair of measuring electrodes;

means for mounting said electrodes for passing through said borehole;

means for supplying survey current to said at least one current-emitting electrode for emission into the media surrounding said mounting means said survey current being returned to an electrode spaced from said plurality of electrodes;

means responsive to the potentials on said first pair of measuring electrodes for supplying a first auxiliary current between said at least one current-emitting electrode and said first return electrode of sufficient magnitude to maintain a given potential relationship between the electrodes of said first measuring electrode pair; and

means responsive to the potentials on said second pair of measuring electrodes for supplying a second auxiliary current between said second current-emitting electrode and said second current return electrode of sufficient magnitude to maintain a given relationship between the potentials of said second measuring electrode pair whereby said survey current will be forced into said formation to thereby obtain a measure of a characteristic of said formation.

3,882,377

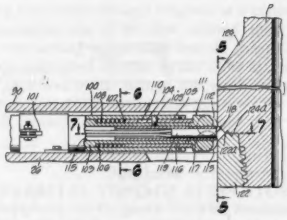
APPARATUS FOR SENSING ANOMALIES AT THE THREADED PIPE JOINTS OF A PIPE STRING USING A DOUBLE TELESCOPING PROBE

Robert R. Kelly, Hoffman Estates, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 314,285, Dec. 12, 1972. This application Apr. 19, 1974, Ser. No. 462,276

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 **2 Claims**



1. Apparatus for sensing anomalies at the threaded pipe joints of a pipe string along which the device is longitudinally moved comprising: an elongated case having a longitudinally extending cylindrical bore therein open at one end thereof, means for supporting said case normal to the pipe string with an open end of said case facing the pipe string and spaced a predetermined distance therefrom, an elongated cylindrical tubular body longitudinally positioned in the bore of said case and having a cylindrical, tubular end portion spaced inwardly from the wall of the cylindrical bore of said case to provide with said wall an annular cylindrical chamber open at said one end of said case, a sleeve received in said chamber for longitudinal sliding movement therein and having one end projecting from said chamber, resilient means biasing said sleeve outwardly of said chamber, means for limiting outward movement of said sleeve in said chamber, means for preventing rotation of said sleeve in said chamber, a head member affixed to said one end of said sleeve, a cylindrical tubular support longitudinally adjustably carried by said head and having one end extending slidably into the bore of the cylindrical tubular end portion of said body, magnetic detector sensor means mounted in the other end of said tubular support and adapted to sense anomalies at the threaded pipe joints, and roller

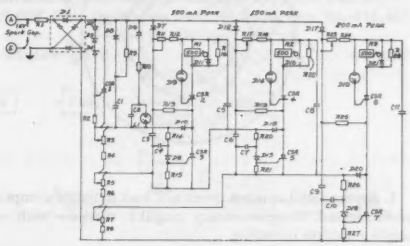
means on said head member and engageable with the pipe joints to roll longitudinally therealong for spacing said head means a fixed distance from said pipe joints.

3,882,378

LEAKAGE SURGE INDICATOR

Peter M. Foord, Eastwood, Australia, assignor to The Electricity Trust of South Australia, Eastwood, Australia

Filed Apr. 12, 1973, Ser. No. 350,340
Int. Cl. G01r *31/02, 19/00*
U.S. Cl. 324—54 **3 Claims**



1. A leakage surge indicator for counting the number of surges of electrical leakage current, above preset magnitudes, occurring across a high voltage insulator of an electrical power transmission line, comprising:

a power supply circuit responsive to the leakage current through said insulator and consisting of rectifiers and capacitors for storing energy from said leakage current; a current magnitude sensing circuit including a zener diode and a first thyristor responsive to the current through said insulator for developing a voltage across a resistance to overcome the zener diode and turn on the first thyristor;

a time delay circuit connected to said sensing circuit and including a timing capacitor, a neon diode, and a second thyristor said timing capacitor being connected to the neon diode for turning on the second thyristor; and

an impulse counter connected to the second thyristor and actuated by the simultaneous conducting of said first and second thyristors in such a manner that after a count a fixed time must elapse before a further count can be recorded.

3,882,379

MEANS FOR DETECTING CORONA WITHIN HIGH-VOLTAGE ELECTRICAL APPARATUS

Chi Lung Kang, Princeton, N.J., assignor to General Electric Company, Philadelphia, Pa.

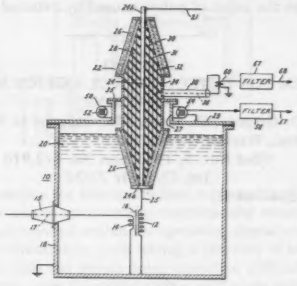
Filed Apr. 11, 1974, Ser. No. 460,237
Int. Cl. G01r *31/02, 31/14*
U.S. Cl. 324—54 **6 Claims**

1. Means for detecting the presence of corona within electrical apparatus comprising: a housing; a high-voltage working part within said housing; and a terminal bushing extending through a wall of said housing for carrying current between a transmission line and said working part, said terminal bushing comprising: a (i) bushing conductor having a first end inside said housing connected to said working part and a second end located outside said housing and adapted to be connected to said transmission line, (ii) a body of electrical insulation surrounding said bushing conductor, (iii) a ground sleeve around a portion of said body of insulation, (iv) a tubular shield embedded in said insulation, surrounding said bushing conductor, and surrounded by said ground sleeve, and (v) a tap extending between said shield and said ground sleeve; and means defining a conductive path between said ground sleeve and ground; said detecting means comprising:

a. means including a first sensor surrounding said bushing conductor and said shield at a location effectively between said conductive path and said second end of said bushing conductor for deriving a first signal substantially proportional to $I_1 - I_2$, where I_1 is the total current in a predetermined high-frequency band flowing into said bushing conductor from said working part and is constituted by $I_{S1} - I_{N1}$, where I_{S1} is a signal current component originating within said apparatus and indicative of corona therein and I_{N1} is a noise current component originating outside said apparatus and flowing through said bushing conductor from said transmission line via said first end; and I_2 is the total current in said predetermined high frequency band flowing between said bushing conductor and said shield through said body of insulation,

b. means sensitive to current in said tap for deriving a second signal substantially proportional to I_2,

c. and means for receiving said first and second signals and for developing a third signal substantially proportional to



$$(I_1 - I_2) + (1 + \frac{Z_2}{Z_1}) I_2 ,$$

where Z_1 is the impedance in said predetermined high frequency band of said working part and Z_2 is the impedance in said predetermined high frequency band between said bushing conductor and ground presented to current flow through said insulating body between said bushing conductor and said shield.

3,882,380

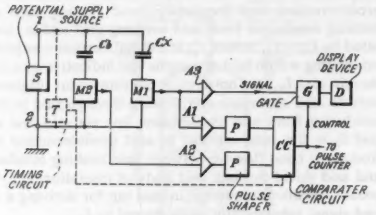
HIGH VOLTAGE COMPONENT TESTING SYSTEMS

Ian Alexander Black, Worthing, Sussex, England, assignor to F. C. Robinson & Partners Limited

Filed Feb. 7, 1973, Ser. No. 330,324
Claims priority, application United Kingdom, Feb. 10, 1972, 6173/72
Int. Cl. G01r *27/26*
U.S. Cl. 324—60 C **17 Claims**

1. A method of testing an electrical component for any partial discharge comprising connecting two separate monitoring units into a circuit arrangement comprising a component to be tested and two terminals of a potential supply source, each of said monitoring units being connected between said two terminals via a respective electrical component, one of which may be the component to be tested, and wherein the output of each monitoring unit is fed to a separate input of a comparator circuit which compares the respective polarities or time relationship of pulses produced by said monitoring units, and the circuit arrangement being such that the polarity or time relationship of pulses caused by any external transient voltage fluctuations imposed upon said potential supply source differs from the corresponding relationship of any respective pulses produced by a partial discharge in any

said component within said circuit arrangement, said comparator circuit being such that it responds to produce an output



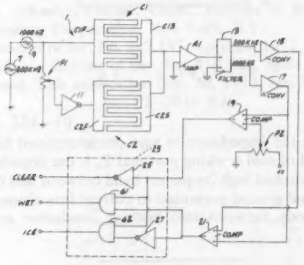
pulse only in the event of the latter type of pulse relationship, and not in the event of pulses caused by external transients.

3,882,381

SYSTEM FOR DETECTING WET AND ICY SURFACE CONDITIONS

Robert O. Gregory, St. Louis, Mo., assignor to Surface Systems, Inc., Warson Woods, Mo.

Filed Nov. 5, 1973, Ser. No. 412,910
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **18 Claims**



1. A system for detecting wet and icy conditions on the surface of highways, airport runways and the like comprising:

a first capacitor adapted to be positioned on a surface the condition of which is to be detected, said capacitor having first and second spaced-apart electrodes adapted to be positioned substantially coplanar with said surface and exposed to atmospheric precipitation thereby to affect the dielectric and capacitance thereof;

a second capacitor comprising first and second electrodes spaced from and substantially identical to and in registration with the aforesaid electrodes and adapted to be positioned so as not to be exposed to atmospheric precipitation;

means for concurrently applying respective out-of-phase time-varying signals to the first electrodes of said capacitors, said second electrodes being commonly connected; and

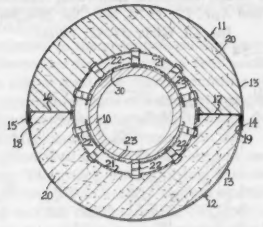
means for indicating when the magnitude of a signal coupled to the commonly connected second electrodes reaches a predetermined magnitude thereby to provide an indication of the presence of any atmospheric precipitation on said surface.

3,882,382

INSULATED CONDUIT COVER AND LEAK DETECTOR

Lowell Johnson, Chicago, Ill., assignor to Transco Inc., Chicago, Ill.

Filed Sept. 7, 1972, Ser. No. 286,896
Int. Cl. G01r *27/02*
U.S. Cl. 324—65 R **4 Claims**



1. An insulated conduit cover and leak detector comprising prefabricated complementary ringlike sections with each ringlike section including

a. an outer metallic cover plate,

b. an encapsulated mat of insulating material within said cover plate,

c. a current conductive member between said cover plate and said conduit to be covered thereby,

d. spacer means connected between said current conductive member and said cover plate and in contact with the conduit for separating and electrically insulating said current conductive member from said cover plate and from the conduit covered thereby, and

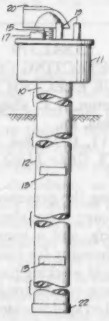
e. electrical means connecting in open circuit said current conductive member, said cover plate, and said conduit and responsive to the escape of moisture through said conduit to close the circuit therebetween.

3,882,383

SOIL MOISTURE SENSING SYSTEM

Charles Matlin, 5552 Lanto St., Bell Gardens, Calif. 90201

Filed June 7, 1973, Ser. No. 367,872
Int. Cl. G01r *27/02*
U.S. Cl. 324—65 R **2 Claims**



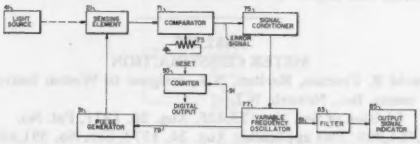
1. In a system for determining the moisture content of soil wherein a soil moisture sensor is an electrical resistive component and where said sensor has a pair of spaced external electrodes in direct contact with the soil, a springlike means for maintaining a constant pressure relationship between each said electrode and the associated soil; said springlike means being a coherent assembly comprising each of said electrode, rubberlike matter and non-electrical conducting tubing; each

said electrode being a flexible electrical conducting strip mounted in an annular arrangement on said tube; said mounting being so effected that there is an acute angled opening between each said electrode and said tube into which opening is wedged said rubberlike matter and so constituting the said springlike means.

3,882,384
ENERGY CONVERSION

William F. List, Linthicum, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 173,488, Aug. 20, 1971, Pat. No. 3,846,028. This application Nov. 16, 1973, Ser. No. 416,469
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 R **4 Claims**

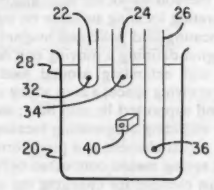


1. Condition measuring apparatus including at least one transistor having an emitter, a collector and a base, means for subjecting said transistor to said condition, means connected to said emitter and collector for impressing in circuit with said emitter and collector, a periodic electrical potential, means responsive to the magnitude of the current transmitted by said collector and emitter as a result of said potential, while said transistor is subject to said condition, for varying the periodicity of said potential, and means for deriving a measurement of said condition from said varied periodicity.

3,882,385
METHOD AND APPARATUS FOR STUDYING PARTICLES HAVING WIDELY DIFFERENT SIZES

Wallace H. Coulter, Miami Springs, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 6, 1974, Ser. No. 439,875
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 CP **27 Claims**



1. A method for studying particles of widely different sizes wherein the particles are suspended in a liquid medium in a vessel and settle through the medium from top to bottom at a rate determined by their size, said method including the steps of:

detecting the concentration at a particular height in said vessel of particles suspended in said liquid medium in excess of a particular size,

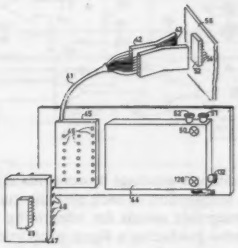
allowing the liquid medium and particles suspended therein to pass through a first aperture in a first tube positioned at said particular height in said vessel in response to said concentration at said particular height decreasing below a first detected concentration, and

allowing the liquid medium and particles suspended therein to pass into a second tube, at a second particular height on said beaker through a second aperture substantially greater in size than said first aperture.

3,882,386
DEVICE FOR TESTING OPERATION OF INTEGRATED CIRCUITAL UNITS

Mario Vinsani, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Mar. 10, 1972, Ser. No. 233,675
Claims priority, application Italy, June 9, 1971, 25624/71
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 R **17 Claims**



1. A test device for testing minimal replaceable electronic circuit units which are normally mechanically mounted and electrically connected within an operating digital electronic system, said circuit units each having a plurality of input and output leads, said test device being operative without removing said circuit units from said system and while said system continues to supply system-generated input signals to said input leads of said circuit units, comprising: a reference circuit, extrinsic to said system and identical to the circuit under test; at least a comparator circuit having two inputs and one output; connector means for temporarily and singularly connecting said input lead terminal of said circuit unit under test to the corresponding input lead terminal of the reference circuit unit placing said input leads in parallel connection to receive said system-generated input signals from said digital electronic system and for connecting at least one output terminal of said circuit unit under test to a first input terminal of the comparator circuit; means for connecting the corresponding output terminal of the reference circuit unit to the second input terminal of said comparator circuit, in such a way, that a discordant signal of a predetermined binary level is present at the output of said comparator circuit whenever two signals of two different binary levels are present at the inputs of said comparator circuit; timing means for permitting the detection of said discordant signal only in case it exceeds a predetermined duration; means for memorizing said detected discordant signal; and alarm means controlled by said memorizing means.

3,882,387
ELECTRICAL CURRENT DETECTOR

Dennis G. Vikstrom, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 23, 1973, Ser. No. 344,072
Int. Cl. G01r *1/22, 19/00*
U.S. Cl. 324—117 R **2 Claims**

1. Means for measuring a d.c. current in a conductor comprising,

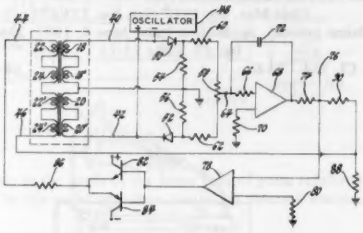
a current sensor for placement in the magnetic field of the current including a unitary folded annular core defining two core halves, the core comprising ferromagnetic material of uniform cross section, so that the core halves carry flux proportional to the magnetic field of the current, and

an excitation winding and a feedback winding on each core half,

and a measuring circuit including,

excitation circuit means for delivering to the excitation windings periodic pulses of unidirectional current sufficient to uniformly saturate the core, and

a detecting circuit connected with the excitation windings and electrically isolated from the periodic pulses having means for differentially summing e.m.f. pulses generated



in the excitation windings by core flux change occurring after the termination of each periodic current pulse, and having integrator means for integrating the differential sum thereby producing a signal proportional to the current in the conductor,

and a feedback circuit associated with the detecting circuit and connected to the feedback windings for supplying current for nulling that d.c. flux in the core material which is due to the current being measured.

3,882,388

APPARATUS INCLUDING A PIEZOELECTRIC ELEMENT FOR CHECKING THE OPERATIVENESS OF A VOLTAGE TESTER

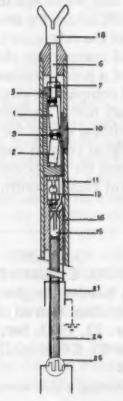
Maurice Nery, Paris, France, assignor to IPA Intarnationale Patent - und Lizenz-Anstalt, Vaduz, Liechtenstein

Continuation of Ser. No. 260,081, June 6, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 447,125

Claims priority, application France, June 7, 1971, 71.20505

Int. Cl. G01r *19/16, 13/36*

U.S. Cl. 324—133 **3 Claims**



1. In a voltage tester of the type comprising one or more contact elements for engaging a conductor to be tested for its voltage condition, an insulated armature for capacitively cooperating with ground, and an indicating circuit including glow discharge means connected between said contact elements and said armature, the improvement which comprises the provision of means for checking the operativeness of said voltage tester comprising a piezoelectric device, a member for applying a mechanical load thereto to produce a voltage between opposed terminals of the piezoelectric device, electrical leads extending from said terminals, and a spark-gap in one of said leads, said leads being arranged for connection across said indicating circuit of the voltage tester, said piezoelectric device comprising a metallic frame having two terminal support points, two piezoelectric elements having respective ends mounted for pivotal movement about said terminal support points, a metallic terminal member located between their other ends so that the piezoelectric elements form a large obtuse angle, said member for applying the mechanical load being mounted adjacent said metallic terminal member to change said angle.

3,882,389

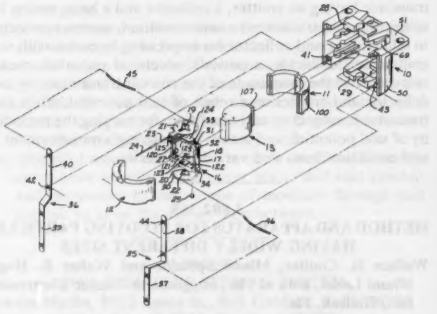
METER CONSTRUCTION

David B. Pearson, Raritan, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Division of Ser. No. 173,425, Aug. 20, 1971, Pat. No. 3,764,909. This application Aug. 24, 1973, Ser. No. 391,496

Int. Cl. G01r *1/16*

U.S. Cl. 324—151 A **39 Claims**



1. A meter comprising a supporting base; a magnetic material yoke mounted on said base; a magnet within and engaging said yoke, said magnet and said yoke having cooperating locating surfaces thereon to locate said magnet within said yoke; fixed cooperating locating surfaces on said base, yoke, and magnet for locating said yoke and magnet on said base; said yoke and magnet defining a moving coil receiving space therebetween; a coil extending around said magnet and through said coil receiving space; a zero adjust element at one end of said coil and supported by said base; said zero adjust element and base including cooperating locating surfaces for locating said zero adjust element at a predetermined position on said base; and spring means connected between said coil and said zero adjust element for changing the at rest position of said coil in response to movement of said zero adjust element.

3,882,390

FLIP-FLOP BALANCE TESTING CIRCUIT

James Allen Lucas, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

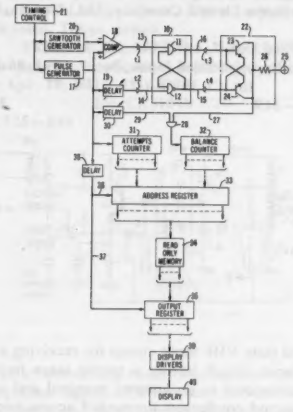
Filed July 31, 1974, Ser. No. 493,326

Int. Cl. G01r *31/28*

U.S. Cl. 324—158 R **13 Claims**

1. An electrical flip-flop balance testing circuit comprising first circuit means for applying a plurality of first input signals to one input of a flip-flop under test at periodic points in time, second circuit means for applying a plurality of second input

signals to the other input of said flip-flop at times continuously varying around said periodic points in time, detector circuit means for generating balance signals responsive to equal output signals on the outputs of said flip-flop, first counter

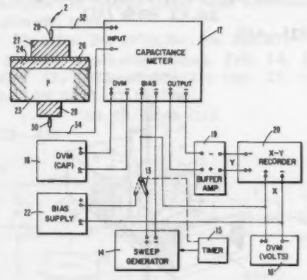


circuit means for counting said balance signals during a predetermined time interval for generating a balance sum signal, and second counter means for counting said first input signals during said predetermined time interval for generating an attempt sum signal.

3,882,391
TESTING THE STABILITY OF MOSFET DEVICES

Robert E. Liles, Pleasant Valley, and Gerald D. O'Rourke, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 25, 1973, Ser. No. 373,042
Int. Cl. G01r *31/26*
U.S. Cl. 324—158 D **6 Claims**

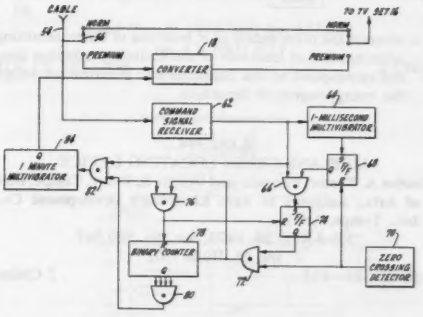


1. A method for determining the stability of semiconductor devices which include a phosphosilicate glass film on the surface thereof to trap contaminants comprising the steps of:
measuring the initial flatband potential across said film;
applying a fixed potential across said film for a duration sufficient to polarize said film and at a temperature insufficient to cause said contaminants to drift;
remeasuring the flatband voltage to determine the polarization of said film;
determining the amount of phosphosilicate glass in said film using the value of polarization;
determining the amount of contaminants present using the value of said initial flatband potential and the value of said polarization; and
comparing said determined amounts to insure that the amount of phosphosilicate glass is sufficient to trap the contaminants present.

3,882,392
HOTEL-MOTEL PAY TV SYSTEM

Ralph P. Harney, Wonder Lake, Ill., assignor to Oak Industries, Inc., Crystal Lake, Ill.

Filed Jan. 29, 1973, Ser. No. 327,582
Int. Cl. H04k *1/00*
U.S. Cl. 325—53 **7 Claims**



1. In a subscription TV system having a central station, a plurality of receivers and cable connections therebetween,
means at the central station for sending TV signals to the receivers, means at each receiver for converting the received TV signals to signals useful in the receiver,
means at the central station for repetitively and periodically transmitting authorization signals over the cable to only predetermined selected authorized receivers, and means at each receiver for enabling its converting means for only a predetermined period and in response to and upon receipt of each of its repetitive and periodic specific authorization signals, said period being longer than the time between consecutive authorization signals,
and clock means at the central station and each receiver for synchronizing the sending and receiving of said authorization signals, said clock means being connected to a power line and using power line frequency as a base.

3,882,393
COMMUNICATIONS SYSTEM UTILIZING MODULATION OF THE CHARACTERISTIC POLARIZATIONS OF THE IONOSPHERE

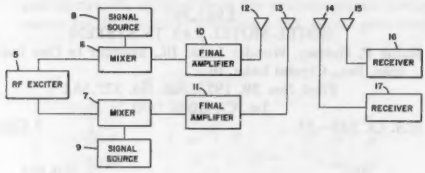
Mark R. Epstein, Chevy Chase, Md., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 4, 1973, Ser. No. 366,932
Int. Cl. H04b *7/10*
U.S. Cl. 325—56 **3 Claims**

1. A method of communicating by way of the ionosphere comprising the steps of:
a. propagating a plurality of polarized radio frequency waves;
b. polarizing said propagated waves at the transmitting location to correspond to the polarization of the characteristic waves for propagation along a ray path of the ionosphere in the region where the transmitted energy enters the ionosphere on its way to a receiving location;
c. receiving said waves with receiving means which is polarized to correspond to the polarizations of the characteristic waves for propagation along the ray path of the

ionosphere in the region where the electro-magnetic departs from the ionosphere in the direction proceeding towards the receiving station;

d. wherein the polarization of at least one of the receiving antennas does not correspond to the characteristic polarization within the energy region of entry; and



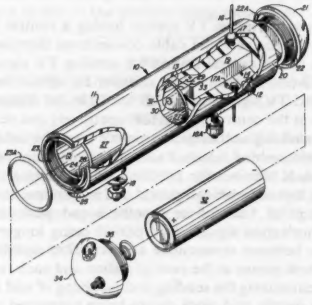
e. wherein the polarization of at least one of the transmitting antennas and at least one of the recieving antennas does not correspond to the characteristic polarization within the energy region of departure.

3,882,394

AIRPLANE CRASH LOCATING DEVICE

Charles A. Koster, Phoenix, and Wayne E. Perry, Tempe, both of Ariz., assignors to Aero Electronics Development Co., Inc., Tempe, Ariz.

Filed Aug. 20, 1973, Ser. No. 389,967
Int. Cl. H04b *1/02*
U.S. Cl. 325—115 **7 Claims**



1. An airplane locating device comprising:

an open ended cylinrical housing having an axially disposed bore,

demountable closure caps one for attaching to each end of said housing,

a radially disposed baffle in said bore to provide a transmitter compartment at one end of the housing and a battery compartment at the other end of the housing,

a radiation antenna attached to the outer circumference of the housing at the transmitter compartment end thereof, switching means mounted in one of said caps for selectively connecting a battery placed in said battery compartment with a transmitter placed in said transmitter compartment,

said switching means comprising a selector switch and an impact switch,

said selector switch in one position directly connecting the battery in said battery compartment to the transmitter in said transmitter compartment and when in another position connecting the battery through said impact switch to the transmitter,

said impact switch upon closure under given impact forces energizing the transmitter, and

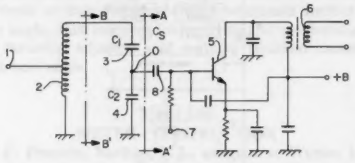
electrical means for opening said impact switch.

3,882,395

SOLID STATE VHF AMPLIFIER CIRCUIT FOR ELIMINATING INTERFERENCE CAUSED BY NONLINEARITY OF A TRANSISTOR

Masashi Sato; Koji Tanaka, and Masaaki Miura, all of Gunma, Japan, assignors to Sanyo Electric Company, Ltd., Osaka and Tokyo Sanyo Electric Company, Ltd., Gunma, both of, Japan

Filed Dec. 7, 1972, Ser. No. 312,917
Claims priority, application Japan, Dec. 7, 1971, 46-100551
Int. Cl. H04b *1/12, 1/14*
U.S. Cl. 325—319 **3 Claims**



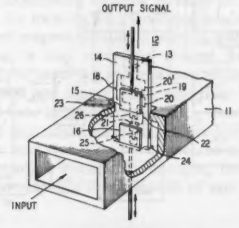
1. In a solid state VHF input circuit for receiving a desired signal said input circuit having a tuning stage including a tuning coil connected to an antenna terminal and a pair of serially connected condensers connected across said tuning coil, and a transistor amplifier stage with AGC having its base coupled to the common terminal between said serially connected condensers to receive the output of said tuning stage, the improvement for eliminating interference problems comprising a third condenser means inserted between said common terminal and said base of said transistor, the capacitance of said third condenser means being selected to prevent reduction of the quality factor of said tuning stage in case of reception in the strong field of broadcast of said desired signal thereby eliminating interference problems caused by the nonlinear characteristics of said transistor.

3,882,396

IMPEDANCE-MATCHED WAVEGUIDE FREQUENCY CONVERTER INTEGRALLY MOUNTED ON STRIPLINE

Martin Victor Schneider, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 10, 1973, Ser. No. 387,343
Int. Cl. H03h *1/02*
U.S. Cl. 325—445 **10 Claims**



7. In combination, a conductively bounded waveguide; means for responding to guided waves within said waveguide via nonlinear conduction, said responding means comprising a planar transmission line penetrating said waveguide and having a dielectric substrate, at least one planar conductor plated on said substrate, and a diode mounted on said substrate within said waveguide and connected to said line by a conductor forming a part of said transmission line; and an impedance-matching dielectric plate movable along said substrate which acts as a guiding surface for motion of said plate along said substrate inside and outside of said waveguide,

whereby said waveguide and said planar transmission line may be respectively tuned.

3,882,397

CARRIER CONVERTING EQUIPMENT

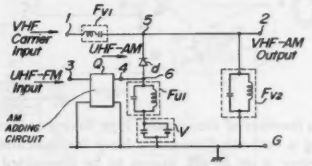
Yoshihiro Konishi, Sagamihara, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Filed Nov. 26, 1973, Ser. No. 419,052

Claims priority, application Japan, Nov. 30, 1972, 47-119312; Apr. 18, 1973, 48-43063

Int. Cl. H04b *7/20*

U.S. Cl. 325—449 **12 Claims**



1. A carrier converting equipment for converting an amplitude modulated signal of a first carrier wave into a corresponding amplitude modulation signal of a second carrier wave of which the frequency is different from that of the first carrier wave, the equipment comprising;

a non-linear element which is variable in conductance,

means for applying said first and second carrier waves to said non-linear element, and

means for deriving an amplitude modulated second carrier wave which is modulated in accordance with the variation of the conductance of said non-linear element, which variation corresponds to the amplitude variation of said amplitude modulated first carrier wave so that the second carrier wave is amplitude modulated according to the amplitude of the first carrier wave.

3,882,398

RECEIVING FREQUENCY INDICATOR SYSTEM FOR BROADCAST RECEIVER

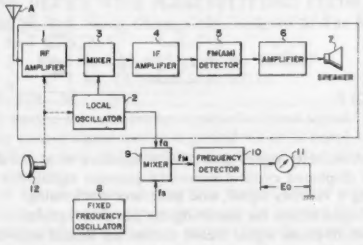
Minoru Ogita, and Teruyoshi Matsui, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Jan. 24, 1973, Ser. No. 326,477

Claims priority, application Japan, Feb. 14, 1972, 47-015449; Oct. 25, 1972, 47-123141; Oct. 25, 1972, 47-123142; Nov. 25, 1972, 47-135796

Int. Cl. H04b *1/16*

U.S. Cl. 325—455 **6 Claims**



1. In a broadcast receiver tuner for receiving a selected one of the broadcast frequencies, said selected one being designated the received frequency, a frequency indicator system comprising, first means for producing a first signal having a reference frequency, second means for producing a second signal having a frequency variable in accordance with the received frequency, a mixer connected to said first and second means for producing a third signal having a frequency equal to the difference frequency of said first and second signal frequencies, a frequency detector connected to said mixer for converting said third signal into a d.c. signal having an amplitude that varies in accordance with said difference frequency, and a meter connected to said detector and carrying a scale marked in receivable broadcast frequencies.

3,882,399

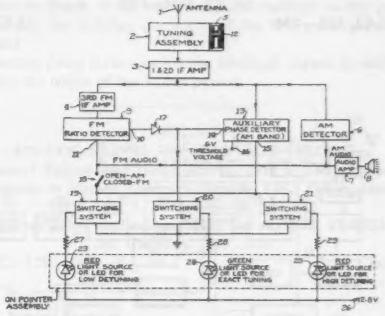
RADIO OR TELEVISION RECEIVER TUNING INDICATOR

Oleh Karpowycz, Addison, and Walter Klymkiw, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 5, 1973, Ser. No. 412,848

Int. Cl. H03j *3/14*

U.S. Cl. 325—455 **2 Claims**



1. A radio receiver comprising:

means for selectively tuning RF broadcast signals;

a readout display comprising first, second and third light emitting devices for visually indicating the tuning condition of said receiver in respect to a selected broadcast signal;

a source of threshold potential;

phase detector means coupled to said tuning means and comprising a tuned circuit responsive to the IF signal associated with said selected broadcast signal for developing control signals representative of the tuning condition of said receiver,

said detector means further comprising a first output terminal and a second output terminal,

means intercoupling said tuned circuit and said source of threshold potential,

said first output terminal exhibiting a control signal of maximum amplitude upon receipt of said selected broadcast signal and a substantially smaller amplitude control signal when said tuning means is detuned from said selected broadcast signal,

said second output terminal exhibiting a signal of predetermined polarity, relative to said threshold potential, when said tuning means is tuned below the frequency of said selected broadcast signal and

exhibiting a signal of predetermined different polarity, relative to said threshold potential, when said tuning means is tuned above the frequency of said selected broadcast signal;

a first switching system intercoupling said first output terminal and said first light emitting device and responsive only to said maximum amplitude control signal to illuminate said first device when said receiver is tuned to said selected broadcast signal;

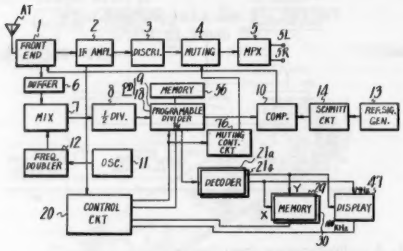
a first auxiliary switching system intercoupling said second output terminal and said second light emitting device and responsive only to a control signal of said predetermined polarity to illuminate said second light emitting device when said tuning means is tuned below the frequency of said selected broadcast signal; and

a second auxiliary switching system intercoupling said second output terminal and said third light emitting device and responsive only to a control signal of said predetermined different polarity to illuminate said third light emitting device when said tuning means is tuned above the frequency of said selected broadcast signal.

3,882,400
BROADCAST RECEIVER

Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 309,803, Nov. 27, 1972, Pat. No. 3,845,394. This application Jan. 3, 1974, Ser. No. 430,483
Claims priority, application Japan, Jan. 9, 1973, 48-5431
Int. Cl. H04b *1/06*
U.S. Cl. 325—456 **15 Claims**



1. A broadcast receiver comprising:

a. a front end having a variable local oscillator for generating a local frequency signal:

b. a programmable divider coupled to said front end and including dividing means and a counter, said dividing means operating to divide the frequency of said local frequency signal by a factor determined by contents of said counter;

c. pulse generator means for producing pulses for changing the content of said counter;

d. a comparator for comparing the divided local frequency signal derived from said programmable divider with a reference signal to produce a control signal for determining the frequency of said local frequency signal generated by said variable local oscillator;

e. means coupled to said front end for converting the output signal produced by said front end to a low frequency signal and to transmit said low frequency signal to output means;

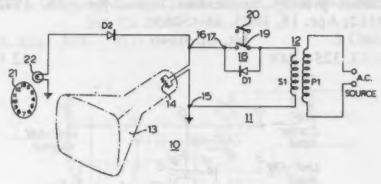
f. a muting circuit connected to said last-mentioned means for selectively inhibiting the transmission of said low frequency signal to said output means; and

g. muting circuit control means activated when the content of said counter is changed for actuating said muting circuit to inhibit said transmission of said low frequency signal, and for sensing when said counter content is not changed for deactuating said muting circuit to enable the transmission of said low frequency signal to said output means.

3,882,401
ILLUMINATING ARRANGEMENT FOR CHANNEL OR STATION SELECTION INDICATOR OF A RECEIVER OF THE STANDBY TYPE

David E. Cleland, Waterloo, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada

Filed Mar. 4, 1974, Ser. No. 447,860
Int. Cl. H05b *39/00*
U.S. Cl. 325—492 **5 Claims**

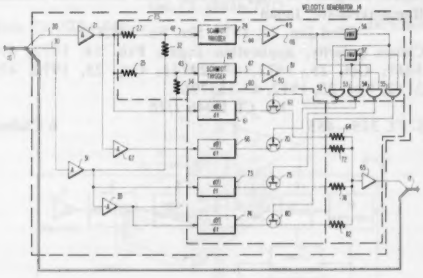


1. In a receiver of the standby type having at least one tube including a cathode filament, a lamp for indicating whether the receiver is on or off, means to be connected to an AC source and including a first diode connected in circuit with said filament for supplying reduced power to said filament during standby operation, a switch connected in shunt with said first diode for bypassing said first diode when said switch is closed to supply full power to said filament during normal operation, and a DC power supply the improvement comprising a second diode connected in a series circuit with said lamp, said series circuit being connected in shunt with said filament and being independent of said DC power supply, said first and second diodes being connected with reverse polarity to inhibit flow of current through said lamp during standby operation but permitting current to flow through said lamp during normal operation.

3,882,402
CIRCUIT FOR TRANSMITTING VELOCITY SIGNALS DERIVED FROM POSITION SIGNALS

Dale J. Jensen, Chelmsford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 26, 1973, Ser. No. 335,895
Int. Cl. H03b *19/00*; **G01p** *3/52, 13/00*
U.S. Cl. 328—13 **6 Claims**



1. A velocity signal generator responsive to a plurality of phase displaced cyclical sinusoidal position signals for transmitting a velocity signal, said generator comprising:

A. input means for receiving the position signals,

B. multi-phase signal means connected to said input means for generating a plurality of mutually exclusive phase signals synchronized to the position signals, one phase signal being associated with each zero crossing for each position signal,

C. gated differentiating means connected to receive each position signal for generating a differentiated position signal as an output signal during intervals determined by

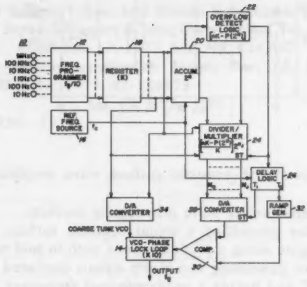
a corresponding one of the phase signals, the output signals having the same polarity, and

D. means for summing the output signals from said gated differentiating means, said summing means thereby transmitting the velocity signal.

3,882,403
DIGITAL FREQUENCY SYNTHESIZER

William G. Gerken, Pittsford, N.Y., assignor to General Dynamics, St. Louis, Mo.

Filed Mar. 14, 1974, Ser. No. 451,665
Int. Cl. H03b *19/00*
U.S. Cl. 328—14 **22 Claims**



1. A frequency synthesizer which comprises

a. means for providing a reference frequency signal;

b. means for detecting the number of periods of said reference frequency signal equal to the lowest integral multiple of a number which is a factor of the frequency to be synthesized, which exceeds a certain number;

c. means operated by said detecting means for providing upon detection of said number of periods, a signal which changes in amplitude;

d. means also operated by said detecting means upon the detection of said number of periods for providing a signal level proportional to the difference between said lowest integral multiple and said certain number divided by said number which is a factor of the frequency to be synthesized;

e. means for generating an output when said signal which changes in amplitude and said level are equal to each other; and

f. said output providing the signal having the frequency to be synthesized.

3,882,404
TIMING DEVICE WITH PULSE SPLITTING FEEDBACK

Reynold W. Bell, Santa Clara, Calif., assignor to The Singer Co., New York, N.Y.

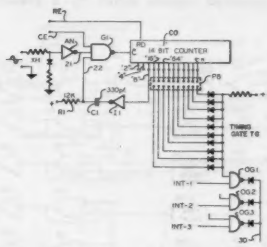
Filed Nov. 29, 1973, Ser. No. 420,067
Int. Cl. H03k *5/00, 21/32*
U.S. Cl. 328—38 **8 Claims**

1. A device for converting a periodic input signal into a periodic output signal having a period which is equal to the sum of the periods of a predetermined number of input signals, comprising:

a gate circuit having at least two inputs, one of which is adapted to receive the input signals for passing the input signals through the gate to provide periodic gated pulses;

a counter which advances in response to the gated pulses for counting the gated pulses and providing the output signal;

feedback means connected to the other input of the gate circuit and responsive to the count condition of the counter for periodically temporarily disabling the gate circuit while an input pulse is passing there though causing a hiatus period in the input pulse during the temporary disabling preceded by a first pulse portion and followed by a last pulse portion, both pulse portions of the input pulse being counted by the counter causing an extra count in the counter for each temporary disabling;



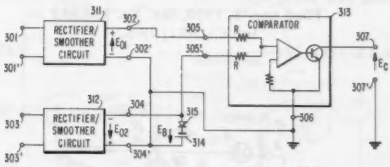
a first delay means within the feedback means for delaying the feedback of the counter count condition to the gate circuit for defining the width of the first pulse portion; and

a second delay means within the feedback means for defining the width of the hiatus period.

3,882,405
ANALOG SIGNAL COMPARATOR CIRCUIT

Mutsunari Tajima, and Isao Komatsu, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 3, 1973, Ser. No. 347,592
Claims priority, application Japan, Apr. 7, 1972, 47-035450
Int. Cl. H03k *5/08, 5/20*
U.S. Cl. 328—146 **3 Claims**



1. An analog comparator circuit of the type which includes first means for rectifying and smoothing a first analog signal to provide a first output signal at its output, second means for rectifying and smoothing a second analog signal to provide a second output signal at its output, and a comparator means connected to receive said first and second output signals, having a minimum resolution level, and adapted to provide an output voltage which varies depending upon the difference in the absolute value of said first and second output signals, wherein the improvement comprises means connected to the output of said second means for clamping the absolute value of said second output signal to a minimum value greater than said minimum resolution level of said comparator means when said absolute value is smaller than said minimum value.

3,882,406
FAULT SUPPRESSING SIGNAL SELECTION APPARATUS

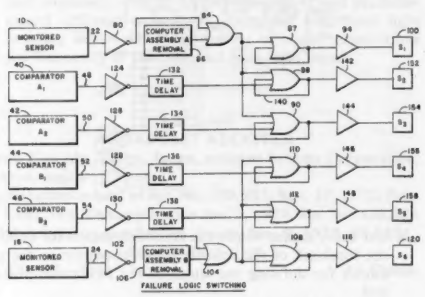
Harry C. Graves, Minneapolis, Minn., and Brian E. Horne, Cheltenham, England, assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 14, 1973, Ser. No. 415,775
Int. Cl. H03k *17/00*
U.S. Cl. 328—150 **8 Claims**

1. Signal selection apparatus for use with a control system having at least three redundant channel signals comprising:

a signal selector means, having a plurality of inputs each for receiving a separate one of said channel signals, said signal selector means for selecting an intermediate value signal from the channel signals received;

comparator means, having two inputs, for comparing signals received at its inputs and generating a switching signal when the received signals differ by a predetermined amount;



connective means for providing said selected intermediate value signal and a first redundant channel signal at the comparator means inputs; and,

means responsive to said switching signal for substituting a passive signal at the signal selector means input which receives said first redundant channel signal.

3,882,407

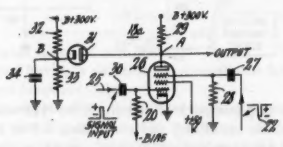
AMPLIFIER BLANKING CIRCUIT

A. Donald Arsem, Liverpool, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1950, Ser. No. 154,855

Int. Cl. H01j *19/82*

U.S. Cl. 328—221 **5 Claims**



1. In combination, an amplifier for amplifying applied signals comprising an amplifier tube having an anode, a cathode, and at least one control grid, an anode resistor through which an operating voltage is applied to said anode, means for biasing said tube so that it has good transconductance whereby there is substantial anode current flow in the absence of applied signals, said tube having an input circuit through which signal may be applied to said tube with its polarity in the direction to increase the flow of anode current in said tube, said tube having a blanking circuit through which a blanking pulse may be applied to drive said tube to anode current cut-off, means for applying said blanking pulse to said blanking circuit, said anode being at a certain potential in the absence of applied input signal and applied blanking pulses, and an un-bypassed unidirectional conducting device that is direct-current connected between said anode and a point of substantially the same potential as said certain potential, said device having an anode that is connected to the anode of said amplifier tube to permit current flow from said anode to said point.

3,882,408

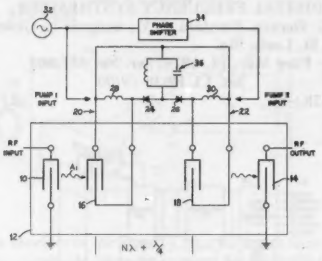
PARAMETRIC ACOUSTIC SURFACE WAVE AMPLIFIER

Bertram A. Auld, Menlo Park, Calif., assignor to Stanford University, Stanford, Calif.

Filed May 18, 1973, Ser. No. 361,788

Int. Cl. H03f *7/04*

U.S. Cl. 330—5.5 **2 Claims**



1. A parametric acoustic surface wave amplifier which comprises

an acoustic surface wave propagating medium,

means for generating a signal acoustic surface wave to propagate along a predetermined path in said medium,

means for generating two pump signals displaced in phase by 90° and having a predetermined frequency relationship to said signal wave to enable parametric interaction, and

means including a pair of transducers connected to said pump signal generating means and positioned on said medium at positions spaced on odd number of one-quarter wavelengths along said predetermined path such that additive relation of acoustic waves reradiated at said transducers occurs.

3,882,409

DIFFERENTIAL AMPLIFIER CIRCUIT

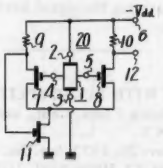
Atsuo Yagi, Ebina, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1974, Ser. No. 463,162

Claims priority, application Japan, May 1, 1973, 48-52287

Int. Cl. H03f *15/00*

U.S. Cl. 330—6 **16 Claims**



1. A differential amplifier circuit comprising:

a power supply source having first and second voltage terminals;

signal input means for providing differential input signal voltages; and

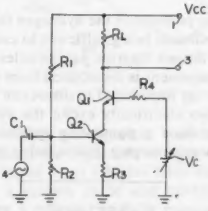
at least a first differential amplifier unit including first, second and third field effect transistors each having gate, source and drain electrodes, means connecting the drain-source paths of said first and second field effect transistors in parallel with each other and in series with the drain-source path of said third field effect transistor between said first and second voltage terminals, means for applying said differential input signal voltages to the gate

electrodes of said first and second field effect transistors, a signal output terminal connected to said drain electrode of said second field effect transistor for providing an amplified output signal, and a feedback loop connected between said drain electrode of said first field effect transistor and said gate electrode of said third field effect transistor for providing negative feedback in respect to common changes in the currents through the drain electrodes of said first and second field effect transistors and positive feedback in respect to the amplification of said differential input signal voltages.

3,882,410
GAIN CONTROL CIRCUIT

Masayuki Hongu, Tokyo, and Hiromi Kawakami, Yokohama, both of Japan, assignors to Song Corporation, Tokyo, Japan

Filed Dec. 13, 1973, Ser. No. 424,307
Claims priority, application Japan, Dec. 13, 1972, 47-124874; Dec. 13, 1972, 47-124875
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **11 Claims**



1. A gain control circuit comprising:

A. a constant signal current source transistor having a base-emitter input circuit and an emitter-collector output circuit, said constant signal current source transistor being biased to operate in its active region; and being supplied with a signal voltage;

B. a gain control transistor having base emitter, and collector electrodes;

C. circuit means to connect said constant current source transistor output circuit in series with said gain control transistor emitter electrode;

D. a load impedance connected to said gain control transistor collector electrode; and

E. a gain control voltage source connected to said gain control transistor base electrode for forward-biasing the base-collector junction of said gain control transistor to control the base-collector impedance thereof so as to control the gain of said gain control transistor.

3,882,411
LINEAR AMPLIFIER

Hideo Ashida, Yokohama; Yoshimasa Daido, Tokyo; Hidemitsu Komizo, and Hiroyuki Suzuki, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 9, 1973, Ser. No. 404,322
Claims priority, application Japan, Oct. 12, 1972, 47-102228
Int. Cl. H03f *3/10*
U.S. Cl. 330—34 **9 Claims**

1. A linear amplifier having a negative resistance amplifier circuit including an avalanche diode, said linear amplifier comprising

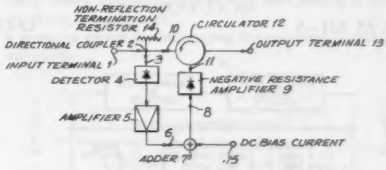
input means for supplying an input signal to the negative resistance amplifier circuit;

coupling means coupled to the input means for diverging part of the input signal;

detector means connected to the coupling means for detecting the part of the input signal;

circuit means connected between the detector means and the negative resistance amplifier circuit for supplying a bias current to the avalanche diode of the negative resistance amplifier circuit and for controlling the bias current in accordance with the amplitude of the detected input signal voltage; and

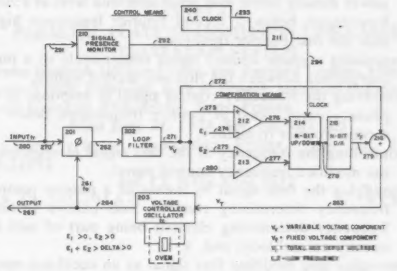
output means coupled to the negative resistance amplifier circuit for providing an output signal.



3,882,412
DRIFT COMPENSATED PHASE LOCK LOOP

Garrett Gordon Apple, Jr., Worthington, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Mar. 29, 1974, Ser. No. 456,213
Int. Cl. H03b *3/04*
U.S. Cl. 331—1 A **12 Claims**

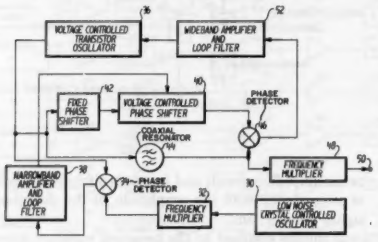


1. In a phase locked loop circuit having a crystal controlled oscillator which has a center operating frequency f_c and output frequency f_o, reference means which provide a reference frequency f_r, first means, including phase comparator means connected to said reference means and to said oscillator for providing an output signal which represents the difference in the values of said frequency signals f_r and f_o, the improvement comprising compensation means, connected to the output of said first means, for receiving said output signal and for generating a frequency representative signal V_f which initially represents the value of the center frequency f_c of said oscillator, including means operative whenever said reference frequency is not present for holding the apparent center frequency of said oscillator to the last reference frequency known, and control means connected between said reference means and said compensation means, said control means being enabled whenever said reference frequency is present to selectively control said compensation means to adjust the value of said frequency representative signal to represent changes in the value of said center frequency f_c of the crystal controlled oscillator.

3,882,413
MICROWAVE SIGNAL SOURCE STABILIZED BY AUTOMATIC FREQUENCY AND PHASE CONTROL LOOPS

Daniel J. Healey, III, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed July 30, 1973, Ser. No. 383,627
Int. Cl. H03b *3/04*
U.S. Cl. 331—9 **13 Claims**



1. A method for controlling the frequency of a signal comprising the steps of:

generating a first signal having a noise power density below a predetermined level at Fourier frequencies above a first Fourier frequency, the frequency of the first signal being automatically controlled about a predetermined center frequency by a frequency control signal provided by a frequency discriminator in an automatic frequency control loop;

generating a second signal having a frequency approximately equal to said center frequency and having a noise power density below said predetermined level at Fourier frequencies below a second Fourier frequency higher than the first Fourier frequency;

generating a phase control signal responsively to a phase comparison between the first and second signals;

modifying the frequency control signal in response to the phase control signal at Fourier frequencies below the second Fourier frequency;

controlling the frequency of the first signal in response to the modified frequency control signal;

modifying the first signal by means of a passive resonant frequency determining element, said passive resonant frequency determining element being part of said frequency control loop; and,

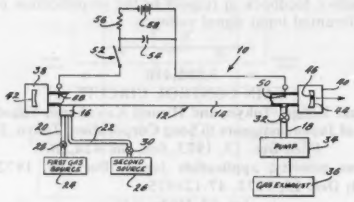
providing said modified first signal as an oscillator output signal.

3,882,414
HALIDE DISSOCIATIVE TRANSFER LASER

William Q. Jeffers, Florissant, and Charles E. Wiswall, Hazelwood, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 5, 1972, Ser. No. 295,195
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 G **1 Claim**

1. A dissociative transfer laser comprising means forming an elongated discharge chamber constructed of a relatively inert substance, a gaseous mixture in said chamber including a mixture of helium gas, hydrogen fluoride gas and molecular hydrogen, said helium gas being present in the mixture in quantities at least equal to about ten times as great by volume as the hydrogen fluoride gas, the pressure of said gaseous mixture being between about 0.01 and 2.0 Torr, optical resonator means capable of sustaining oscillation at the wavelengths 7037.45 A, 7127.77A, 7202.37A and 7800.22A and including a pair of spaced reflectors positioned to be in optical communication with each other through the gaseous mixture, one of said reflectors being located adjacent to each opposite end of the discharge chamber, a pair of spaced electrodes mounted extending into the discharge chamber adjacent opposite ends thereof in the space between the spaced reflectors, and means including a source of voltage connected between said electrodes to produce an electric discharge through the gaseous mixture sufficient to cause at least some of the helium gas to go into a metastable condition and to produce collisions

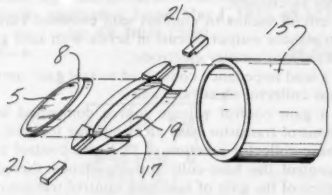


with some of the particles of the hydrogen fluoride gas that are present, said collisions being sufficient to cause dissociation of some of the hydrogen fluoride gas particles whereby some of the fluoride component is dissociated from its hydrogen component, the energy introduced to dissociate the fluoride being sufficient to also electrically excite the dissociated fluoride particles to produce a population inversion of the energy levels and an accompanying visible lasing condition.

3,882,415
GLASS LASER DISCS WITH ANNULAR ALKALI LEAD BORATE COATINGS AND USES THEREOF

Richard F. Cooley, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 13, 1973, Ser. No. 332,057
Int. Cl. H01s *3/16*
U.S. Cl. 331—94.5 E **17 Claims**



1. A glass laser disc having an annular alkali lead borate glass coating capable of absorbing energy at a wave length of 1.06 microns to thereby absorb parasitic oscillations, the glass coating having an index of refraction not more than about 12 percent greater than the index of refraction of the disc, the thermal expansion and contraction of the coating being matched with the disc so that undesirable strains therein are not developed in the disc; the glass coating comprising:

1. a mixture of alkali metal oxides in which at least two different alkali metal oxides are present, and any K_2O that is present is limited to an amount of not substantially more than about 1 percent by weight; and
2. an effective energy-absorbing amount of a heavy metal oxide that absorbs energy at a wave length of about 1.06 microns.

3,882,416
THERMALLY PUMPED GASDYNAMIC LASERS

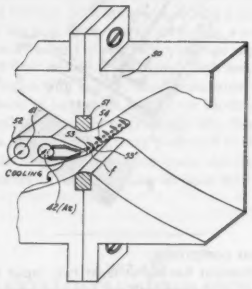
Roland P. Borghi, Chatenay-Malabry; Marc A. Charpenel, Longjumeau, and Jean-Pierre Taran, Bures-sur-Yvette, France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed July 16, 1973, Ser. No. 379,478

Claims priority, application France, July 17, 1972, 72.25705; Mar. 16, 1973, 73.09584

Int. Cl. H01s *3/22, 3/09*

U.S. Cl. 331—94.5 G **5 Claims**



1. A thermal mixing gas dynamic laser adapted to emit radiation by means of the expansion of a gas mixture containing as a lasing material a gas selected from the group consisting of nitrogen, a carbon oxide and mixtures thereof and further containing a relaxant additive monoatomic gas, said laser comprising:

hot gas generating means for delivering a gas flow containing at least nitrogen at high pressure and high temperature;

a convergent and divergent expanding nozzle having a throat between convergent and divergent portions thereof for expanding said gas flow to supersonic speed located downstream from said generation means;

means for adding carbon oxide to the gas flow upstream of the divergent portion of said nozzle;

an optical resonance cavity for extracting the vibrational energy of the mixed nitrogen and carbon oxide gases and producing a coherent radiation downstream from the divergent portion of said nozzle;

an injector means for adding the relaxant additive monoatomic gas to the gas mixture located in the vicinity of said throat portion of said nozzle and delivering said additive gas substantially along the direction of said gas flow; and, wherein said nozzle is bidimensional having two plane parallel and opposite sides and having other sides which are evolutive and symmetrical and wherein said injector is in the form of a wing which is traversed by a feed package for delivering the gas at the trailing edge of said wing and said wing is pierced by holes for the communication between said feed package and said nozzle.

3,882,417
GAS ION LASER CONSTRUCTION FOR ELECTRICALLY ISOLATING THE PRESSURE GAUGE THEREOF

Charles E. Wood, Manhattan Beach, and Robert S. Witte, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sept. 10, 1973, Ser. No. 395,895

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 T **5 Claims**

1. A gas ion laser comprising:

a. a main envelope consisting of an insulating material and including an ionizable laserable gas;

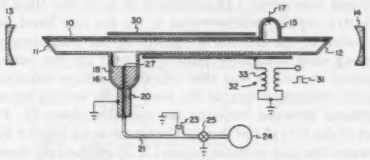
b. a first appendix in communication with said main envelope;

c. an anode disposed in said first appendix;

d. a second appendix in communication with said main envelope;

e. a cathode disposed in said second appendix, said cathode being a cold cathode formed by a slug of metal substantially filling said second appendix and having a central aperture therethrough;

f. a pressure gauge for measuring the pressure in said main envelope;



g. a metallic tube interconnecting said central aperture in said cathode with said pressure gauge, whereby said anode, said cathode and said pressure gauge are interconnected in series to permit a continuous gas movement therein, said metallic tube extending partially through the central aperture in said cathode;

h. means coupled to said anode and to said cathode for applying an electric potential thereto and for creating a discharge through said main envelope in the laserable gas; and

i. means optically coupled to said main envelope for stimulating a coherent beam of radiation from the laserable gas.

3,882,418
PARALLEL PLATE TRANSMISSION LINE LASER EXCITATION SYSTEM

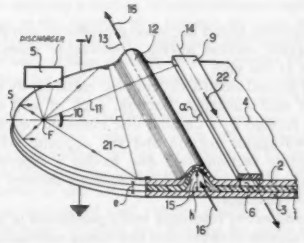
Bruno Godard, Gif-sur-Yvette, and Bernard Lacour, Villebon-sur-Yvette, Palaiseau, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed June 21, 1974, Ser. No. 481,725

Claims priority, application France, June 22, 1973, 73.22972

Int. Cl. H01s *3/09, 3/22*

U.S. Cl. 331—94.5 G **8 Claims**



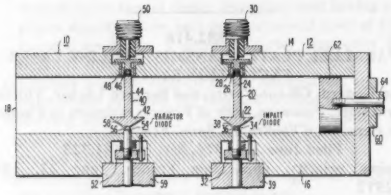
1. In a laser generator including: an active gaseous medium; an electric excitation line formed by an insulating plate inserted between a first metallic plate and a second metallic plate, an edge of the said plates being formed in the shape of a parabola, the foci as well as the apices of the parabolas being respectively arranged on the same straight line perpendicular to the plane of the plates, the metallic plates being parallel to one another and connected to a voltage source, the first metallic plate having at least one slot separating it into two distinct parts, the common axis of the parabolas forming an angle α greater than zero with the slot; means for maintaining an

active gaseous medium in the said slot, comprising a longitudinal blade closing the slot and fixed to the said two parts of the first metallic plate; and means for generating a current wave in the said line, comprising a release circuit for setting up a substantially punctiform discharge between the said metallic plates at the level of the foci of the parabolas; and comprising the improvement wherein: in the immediate vicinity of said slot (6) and on the side of said release circuit (5), said insulating plate (1) as well as said first metallic plate (2) form a projecting part (12) so that a cavity (15) having an axis (13) substantially parallel to the axis (4) of the slot(6) is formed between the insulating plate (1) and said second metallic plate (3); and said cavity (15) contains at least one fluid having a dielectric rigidity whose value is, on the one hand, less than the value of the dielectric rigidity of the insulating material forming said insulating plate (1) and, on the other hand, adjusted in such a way that any over-voltage induced in the electric excitation line at the time of the setting up of a first discharge between between the metallic plates (2, 3) at the level of the foci (F) of the parabolas causes a second discharge between the said metallic plates (2, 3) exclusively through the fluid in the said cavity (15).

3,882,419
VARACTOR TUNED IMPATT DIODE MICROWAVE OSCILLATOR

George Allan Swartz, Princeton, and Cheng Paul Wen, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,221
Int. Cl. H03b 7/14
U.S. Cl. 331—96 5 Claims

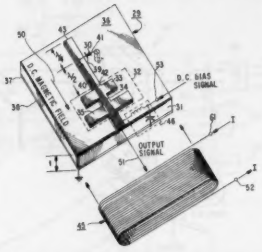


1. A frequency tuned microwave oscillator comprising:
a waveguide section having a moveable short-circuiting piston at one end;
first and second electrically coupled radial cavity resonators within said waveguide section, each of said resonators being formed by a circular disc mounted on one wall of said waveguide section and the opposite wall of said waveguide section, said disc having a tapered surface facing said opposite wall and defining thereby the cavity of said resonator;
said second cavity resonator being positioned in said waveguide section between said first cavity resonator and said moveable short circuiting piston and separated from said first cavity resonator by a distance which is substantially equal to an integral number of half-wavelengths of the generated microwave signal;
said moveable short-circuiting piston being adjusted to be separated from said second cavity resonator by a distance which is substantially equal to an integral number of half-wavelengths of the generated microwave signal;
a microwave generating element disposed within said first cavity resonator; and
a variable reactance element disposed within said second cavity resonator.

3,882,420
MAGNETICALLY TUNABLE FERRITE STRIPLINE TRAPATT MODE OSCILLATOR AND AMPLIFIER CIRCUITS

Shing-Gong Liu, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,210
Int. Cl. H03b 3/04, 7/14; H03f 3/10
U.S. Cl. 331—99 7 Claims

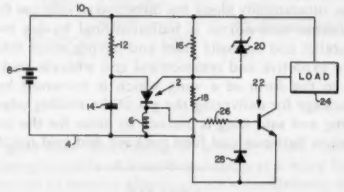


1. Apparatus comprising:
an active element having at least two input terminals and exhibiting a current-voltage characteristic including a negative resistance portion for causing said element to operate in a Trapatt mode in response to a bias signal exceeding a predetermined threshold magnitude;
a transmission line circuit on a ferrite substrate including said element operating in said Trapatt mode and generating signals at a desired frequency during periods when said bias signal exceeds said predetermined threshold magnitude, said transmission line circuit having a first magnetically tunable portion determining said desired frequency and a second portion having a magnetically tunable impedance for operating said element in said Trapatt mode.

3,882,421
LOW POWER PULSE GENERATOR

Jeffrey P. Stein, Devon, Pa., assignor to Honeywell, Inc., Minneapolis, Minn.

Continuation of Ser. No. 256,904, May 25, 1972, abandoned.
This application June 29, 1973, Ser. No. 375,100
Int. Cl. H03k 3/335
U.S. Cl. 331—111 6 Claims



1. A pulse generator comprising:
a programmable unijunction transistor having an anode electrode, a cathode electrode and a gate electrode;
energizing means connected to said anode electrode and to said cathode electrode to energize said unijunction transistor into a current conducting state;
de-energizing means connected to said gate electrode to de-energize said unijunction transistor to terminate said current conducting state after a predetermined time following the energizing of said unijunction transistor by said energizing means,

said de-energizing means including current path means providing a current path to said gate electrode after said predetermined time, said current path having a current demand greater than the current capable of being supplied by said unijunction transistor from said gate electrode,

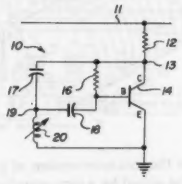
said current path means including a first current path means connected between said gate electrode and a source of energizing current and a second current path means connected between said gate electrode and said source of energizing current and arranged to provide a low impedance current path upon the occurrence of a predetermined current in said first current path means,

said second current path means including a Zener diode and said first current path means including a voltage generator means arranged to produce a voltage representative of a current flow in said first current path means and circuit means connecting said voltage generator means to said Zener diode to back-bias said Zener diode into a nonconducting state upon the occurrence of a first level of current flow in said first current path and to bias said Zener diode into a conducting state upon the occurrence of a second level of current flow in said first current path means.

3,882,422
LC AND CRYSTAL TRANSISTOR OSCILLATORS

Karol Freed, 1424 N. Walnut, Arlington Heights, Ill. 60004

Filed May 6, 1974, Ser. No. 467,261
Int. Cl. H03b *5/12, 5/36*
U.S. Cl. 331—116 R **10 Claims**

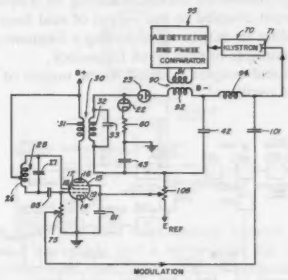


1. An oscillator circuit comprising: solid state amplifier means having a common, an output and a control electrode, first circuit means coupled to a supply voltage and to said solid state amplifier means for applying operating voltage to said electrodes of said solid state amplifier means, said operating voltage being of a predetermined value, inductive reactance means, capacitive reactance means connected in series with said inductive reactance means to form a resonant circuit therewith and to form a coupling circuit point therebetween, second circuit means for connecting said inductive reactance means to said common electrode, third circuit means for connecting said capacitive reactance means to said output electrode, and a coupling capacitor connected between said coupling circuit point and said control electrode for providing feedback to sustain the oscillation of said oscillator circuit, and to effectively isolate said resonant circuit from other circuit parameters, whereby the peak-to-peak amplitude of the oscillations obtained from the oscillator circuit is substantially equal to the supply voltage and the frequency of the oscillations thereof is substantially dependent upon the value of the inductive reactance means and the capacitive reactance means forming the resonant circuit.

3,882,423
KLYSTRON CONTROL CIRCUIT

Harry L. Gerwin, Bethesda, Md.; Robert J. Darcey, and Houston D. Hoyt, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 12, 1957, Ser. No. 671,672
Int. Cl. H01s *1/02*
U.S. Cl. 332—7 **2 Claims**



1. A klystron modulator and mode control circuit, comprising in combination: an electron-coupled oscillator having a pentode with an ungrounded suppressor grid; a transformer having its primary winding connected in the plate circuit of said pentode tube; a voltage doubler comprising first and second diodes and first and second capacitors, the plate of said first diode and the cathode of said second diode being connected to one end of the secondary winding of said transformer, one end of said first capacitor being connected to the cathode of said first diode, said cathode of said first diode being at circuit ground, and one end of said second capacitor being connected to the plate of said second diode, the other ends of said first and second capacitors being connected to the other end of said secondary winding; a potentiometer having its ends connected between a reference voltage and the junction of said first and second capacitors and its variable arm connected to the suppressor grid of said pentode tube, movement of the variable arm of said potentiometer varying the voltage applied to said suppressor grid causing the negative output voltage of said voltage doubler obtained between the plate of said second diode and circuit ground to be varied; means for applying a portion of said electron-coupled oscillator voltage to the repeller of a klystron to cause modulation of said klystron; means for applying said negative output voltage of said voltage doubler to said repeller to provide a negative bias for said repeller; and means for controlling said negative bias on said repeller to maintain said klystron on mode center, said means for controlling including means for injecting a correction voltage in series with said second diode, said correction voltage having an amplitude proportional to the amount said repeller bias is off mode center and having a phase relative to said klystron modulating voltage such that said output voltage of said voltage doubler changes in the amount necessary to place said klystron on mode center.

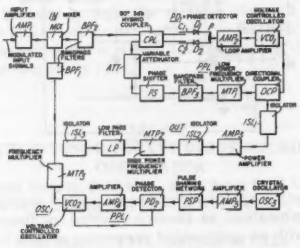
3,882,424
PHASE LOCKED LOOP TRANSMITTER

Pierre G. M. J. Debois, Duffel; Albert F. Liekens, Gravenwezel, and Gilbert Quaghebeur, Bornem, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 27, 1973, Ser. No. 429,006
Claims priority, application Belgium, Dec. 29, 1972, 793483
Int. Cl. H03c *3/08*
U.S. Cl. 332—18 **8 Claims**

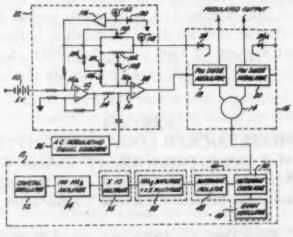
1. A phase locked loop transmitter comprising:

a first source of modulated input signals;
a second source of stabilized reference signals having a given frequency;
a mixer coupled to said first and second sources;
a phase locked loop including
a phase detector having two inputs, one of said two inputs of said phase detector being coupled to the output of said mixer,
a loop amplifier coupled to the output of said phase detector,
a voltage controlled oscillator having its frequency control input coupled to the output of said loop amplifier providing an output signal having a frequency equal to a submultiple of said given frequency,
a directional coupler coupled to the output of said controlled oscillator,



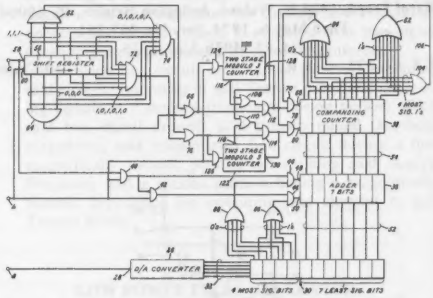
a low power frequency multiplier coupled to one output of said directional coupler to provide an output signal having a frequency equal to said given frequency,
a bandpass filter coupled to the output of said low power frequency multiplier,
a phase shifter coupled to the output of said bandpass filter, and
a variable attenuator coupled between the output of said phase shifter and the other of said two inputs of said phase detector;
a power amplifier coupled to the other output of said directional coupler; and
a high power frequency multiplier coupled to the output of said power amplifier to provide an output signal having said given frequency for said transmitter.

3,882,425
LINEAR MICROWAVE MODULATOR
Darrell A. Briley, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Aug. 27, 1973, Ser. No. 392,129
Int. Cl. H03c *1/06*
U.S. Cl. 332—37 D **16 Claims**



1. A microwave modulator, comprising in combination:
means for generating a carrier signal;
means for generating a reference signal;
modulator means responsive to a modulator drive signal and operative to produce a modulated output signal comprising said carrier signal and a modulation component;
circuit means for compensating for variations in the response of said detecting means due to environmental temperature changes;
means having an output for detecting said modulation component;
means coupled to said modulation signal generating means and said detecting means for determining a signal difference between said reference signal and said modulation component, and operative to derive said modulator drive signal, which modulator drive signal is a function of said difference signal; and,
means applying said modulator drive signal to said modulator means.

3,882,426
INCREMENT VARYING MEANS FOR INCREMENTAL ENCODER AND DECODER
David F. Hoeschele, Jr., Norristown, Pa., assignor to General Electric Company, Fairfield, Conn.
Continuation-in-part of Ser. No. 361,598, May 18, 1973, Pat. No. 3,835,385. This application July 16, 1973, Ser. No. 379,435
Int. Cl. H03k *13/22*
U.S. Cl. 332—11 D **5 Claims**



1. In apparatus for the interconversion of a first representation of an information signal by a time-varying amplitude with a second representation of the same information signal by a succession of pulse signals each having one of two possible logical significances which represent the sign of the change in the amplitude of the first representation since the occurrence of the last preceding pulse signal of the second representation, which comprises:
a source of clock pulses connected to herein subsequently recited pulse sequence analysis means, digital companding counter means, and adder means;
pulse sequence analysis means to receive the said pulse signals in sequence and to produce responsively thereto a first pulse sequence output signal when a first predetermined number of pulses in the sequence are all of the same logical significance and a second pulse sequence output signal when a second predetermined number of pulses in the sequence are of alternate logical significance;
digital companding counter means connected to be stepped to be increased in registration during the existence of a first pulse sequence output signal and to be decreased in registration during the existence of a second pulse sequence output signal;
adder means connected to receive the registration of the companding counter means and, responsively to a pulse signal of the second representation of first logical significance to add, and responsively to a pulse signal of the second representation of second logical significance to

subtract, the registration of the companding counter means to and from the content of

digital storage means, which are connected to

digital to analogue converter means whose output is the said first representation;

the improvement which comprises:

companding counter control means comprising:

companding counter registration function means connected to registration outputs of the said companding counter, and, responsively thereto, to control

stepping impulse control means to step the companding counter means at a maximum rate when the companding counter registration is greater than a predetermined value and to step the companding counter means at a lower rate when the companding counter registration is not greater than the predetermined value.

3,882,427

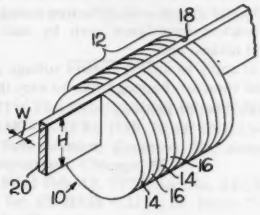
TRANSIENT DAMPING MEANS FOR AN ELECTRICAL INSTALLATION

Herbert M. Pflanz, Westwood, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 20, 1972, Ser. No. 316,985

Int. Cl. H04b *3/28*; 178 *45*

U.S. Cl. 333—12 25 Claims



1. An apparatus for connection in circuit with an electrical conductor means to substantially attenuate high frequency electrical voltages and currents in said circuit, but which transmits electrical voltages and currents of normal power frequency or direct current without substantial attenuation thereof, comprising a body of magnetic material, a slot extending inwardly and lengthwise of said body from an outer peripheral surface of said body, and an electrical conductor member of non-magnetic material received in said slot in magnetically inductive relation to said magnetic body, said conductor member extending to contiguous the outer peripheral end of said slot, said conductor member having substantially greater electrical conductivity than said magnetic material, said conductor member being adapted to be connected in circuit with said conductor means whereby to transmit through said conductor member without substantial attenuation electrical currents of normal power frequency and direct current but with substantial attentuation of high frequency electrical voltages and currents.

2. An apparatus as defined in claim 1 in which said conductor member is of triangular cross section, with an apex of the triangular cross section being located at a peripherally outer portion of said slot, whereby to provide a reduced cross-sectional area and hence higher resistance path in the region of said apex for flow of high frequency currents.

3,882,428

NON-RECIPROCAL FIELD DISPLACEMENT ISOLATOR

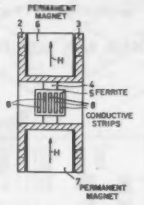
Johannes Petrus Leenders, and Peter Caspar Stephanus Rutjes, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,471

Claims priority, application Netherlands, Mar. 22, 1973, 73/04001

Int. Cl. H01p *1/32*

U.S. Cl. 333—24.2 3 Claims



1. A non-reciprocal field displacement isolator, comprising a rectangular waveguide and a rectangular bar of gyromagnetic material which is arranged in the waveguide at a small distance from one of the side walls, the side faces of the said bar extending parallel to the waveguide walls, the bar of gyromagnetic material being prepolarised in the direction of the smallest dimension of the waveguide by a static magnetic field, characterized in that electrically properly conductive strips which are insulated from each other by intermediate spaces are provided on the surface of the bar of gyromagnetic material which faces the centre of the waveguide, the longitudinal dimensions of the said strips coinciding with the direction of the static magnetic field.

3,882,429

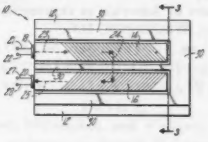
ULTRASONIC SIGNAL TRANSMISSION DEVICE WITH PHASE RESPONSE SHAPING

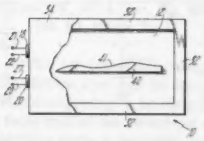
Tom Alan Martin, Collinsville, Conn., assignor to Andersen Laboratories, Inc., Bloomfield, Conn.

Filed Mar. 29, 1974, Ser. No. 456,301

Int. Cl. H03h *9/26*, *9/30*

U.S. Cl. 333—30 R 17 Claims





1. An electrical signal transmission device of the acoustic, reflection mode type comprising:

a. a medium for supporting propagation of acoustic energy;

b. a mismatching structure in said medium from which a portion of acoustically propagating energy is reflected;

c. transmitting and receiving transducer means for converting an input electrical signal into an acoustic signal propagating along said medium and for converting a reflected acoustic signal into an output electrical signal; and

d. a region of phase affecting material located on said medium in the path of the reflected acoustic signal, the profile and thickness of said region being predetermined to shape the phase response of said device.

3,882,430

SURFACE ACOUSTIC WAVE DEVICES

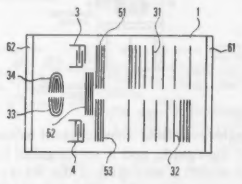
Charles Maerfeld, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 25, 1974, Ser. No. 482,848

Claims priority, application France, June 29, 1973, 73.23999

Int. Cl. H03h *9/26, 9/30;* **H01v** *7/00*

U.S. Cl. 333—30 R **7 Claims**



1. A surface acoustic wave device comprising a piezoelectric substrate for propagating acoustic waves, an input transducer for converting high frequency electrical waves into acoustic waves for propagating at the surface of said substrate, at least one dispersive grating of non-uniformly spaced discontinuities, and an output transducer for converting the acoustic waves when reflected by said grating, into electrical waves, said grating (2) discontinuities being disposed perpendicularly to the direction of propagation of said acoustic waves, said device further comprising at least one 3 dB coupler (5) of the type having regularly spaced parallel conductive strips arranged between said input (3) and output (4) transducers and said dispersive grating (2), said conductive strips of said coupler (5) being parallel to said discontinuities of said grating (2).

3,882,431

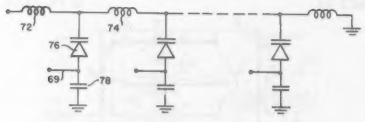
DIGITAL PHASE SHIFTER

Francis W. Hopwood, Severna Park; Stuart S. Horwitz, and Lester K. Staley, both of Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 10, 1973, Ser. No. 387,425

Int. Cl. H03h *7/18*

U.S. Cl. 333—31 R **4 Claims**



1. A digital phase-shifter circuit capable of providing 360° phase shifts for use in phased array applications, comprising:
first and second quadrature hybrid means, each having four terminals;
first and second voltage-variable reactance means connected respectively to the second and third terminals of said four terminals of said first quadrature hybrid means;
third and fourth voltage-variable reactance means connected to the second and third terminals respectively of said second quadrature hybrid means, said voltage-variable reactance means acting as reactive loads on their respective quadrature hybrid means,
each of said quadrature hybrid means in combination with their respective voltage-variable-reactance means acting to shift the phase of a input signal by 90° plus the phase shift due to the reactive load on said quadrature hybrid means; and
digital-to-analog converter means acting to receive a digital input and convert said digital input into an analog control voltage, said analog control voltage being applied to each of said voltage-variable reactance means and acting to vary the reactances of said voltage-variable reactance means in accordance with said digital input,
a first terminal of said first quadrature hybrid means acting to receive an input signal, a fourth terminal of said first quadrature hybrid means connected to the first terminal of said second quadrature hybrid means and acting to apply the phase-shifted signal to said second quadrature hybrid means, a fourth terminal of said second quadrature hybrid means providing an output signal with the desired phase shift,
said voltage-variable reactance means comprising:
a varactor diode;
a capacitor connected between the anode of said varactor diode and ground potential and acting to provide an A.C. ground to said varactor diode;
a first inductor connected between the cathode of said varactor diode and ground;
a second inductor connected between the cathode of said varactor diode and an input from said quadrature hybrid means, said inductors acting to linearize the reactive impedance seen by said quadrature hybrid means; and
means to apply an analog control voltage at the anode of said varactor diode in order to vary the reactance of said varactor diode.

3,882,432

RF BROADBAND TRANSMISSION LINE IMPEDANCE MATCHING TRANSFORMER PAIR FOR LESS THAN 4 TO 1 IMPEDANCE TRANSFORMATIONS

Dennis W. Bowman, Eatontown, and Robert E. Horn, Middletown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

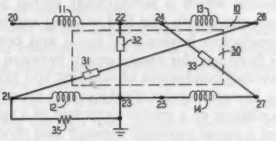
Filed June 28, 1974, Ser. No. 484,361

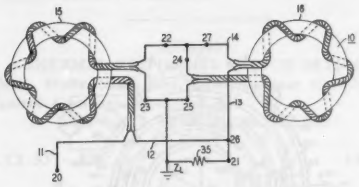
Int. Cl. H03h *7/38*

U.S. Cl. 333—32 **7 Claims**

7. A broad band impedance matching device having four conductors coil-wound and serially connected in pairs to form input and output coils in either side of a transmission line and one side of said transmission line being grounded between input and output coils characterized in that a load impedance is connected across said input coil in the grounded side of said transmission line and a network is connected across the two

sides of said transmission line, said network having means to produce a ratio of input and output impedance in said device





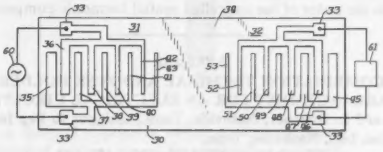
following the series $(n+1/n)^2$ where n is an integer greater than unity.

3,882,433

SWIF WITH TRANSDUCERS HAVING VARIED DUTY FACTOR FINGERS FOR TRAP ENHANCEMENT

Sundaram Subramanian, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 15, 1974, Ser. No. 442,950
Int. Cl. H03h *9/32, 9/26;* **H01v** *7/00*
U.S. Cl. 333—72 **4 Claims**



1. An acoustic surface wave filter having a predetermined transfer function which defines a major passband essentially centered about a synchronous frequency and adjacent traps, said filter comprising:

a piezoelectric surface wave propagating medium having an attenuation characteristic and defining a propagating surface; and

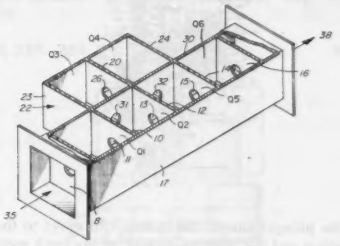
a transmitting transducer and a receiving transducer formed on said surface for respectively launching and receiving surface waves, each transducer including a pair of interdigitated comb-like arrays of spaced electrically conductive fingers, said attenuation characteristic resulting in substantial reduction of surface waves propagating across said transducers, at least one of said transducers having a duty factor gradient having a maximum for conductive fingers farthest from the other of said transducers and a minimum for those nearest said other transducer, said gradient compensating for said surface wave reduction.

3,882,434

PHASE EQUALIZED FILTER

Ralph Levy, Newton, Mass., assignor to Microwave Development Laboratories, Needham Heights, Mass.

Filed Aug. 1, 1973, Ser. No. 384,719
Int. Cl. H01p *5/04, 7/06;* **H03h** *7/08*
U.S. Cl. 333—73 W **11 Claims**



1. A microwave band-pass filter having a relatively flat group delay and linear phase over the central portion of the pass-band, said filter comprising;

means defining a first series of resonant elements,

means for coupling an input signal to a resonant element of the first series,

the resonant elements in the first series being each directly coupled in consecutive order with its adjacent element,

means defining a second series of resonant elements smaller in number than the number comprising said first series and arranged with each resonant element opposite and in substantial alignment with a different resonant element in the first series,

means coupling from a last resonant element in the first series for obtaining an output signal therefrom,

the resonant elements in the second series being each directly coupled in consecutive order with its adjacent element,

said first and second series being arranged to provide a main path through all of said resonant elements with at least one cross-coupling path being provided between two adjacent elements of the first series,

means for independently tuning each resonant element, and tuning means associated with said one extra cross-coupling path.

3,882,435

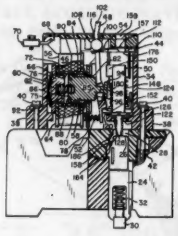
LATCH ATTACHMENT FOR AN ELECTROMAGNETICALLY OPERATED SWITCHING DEVICE

William E. Grass, Milwaukee, and Walter C. Karch, Grafton, both of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed June 28, 1974, Ser. No. 484,058
Int. Cl. H01h *50/32*
U.S. Cl. 335—164 **11 Claims**

1. A latching device for releasably maintaining a linearly movable switching device operator in an operated position, said latching device comprising: a housing having a rear end mountable on a front end of the switching device, a latching lever having a latching surface movable between a released and a latching position in the housing, a spring biasing the latching lever and the latching surface toward the latching position, a latching assembly including: a movable plunger having a rear end engaging a front end of the operator and front end extending through an opening in a front end of the housing, a spring biasing the plunger toward the operator, a latch member movably mounted on the plunger providing a latching surface spaced between the ends of the plunger, adjustment means interconnecting the plunger and the latch member, said adjustment means including a constraining

means for preventing relative movement between the latch member and the plunger when the plunger is moved by the spring and permitting relative movement between the latch member and plunger when a manual force applied to the front



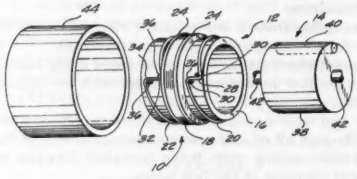
end of the plunger causes the operator to move to the operated position and the latching surface on the latch member to move to a position where it is engaged by the latching surface on the latching lever when the latching lever is at the latching position.

3,882,436

DIFFERENTIAL TRANSFORMER

Jacob Chass, Forest Hills, N.Y., assignor to Pickering & Company, Inc., Plainview, Long Island, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,490
Int. Cl. H01f 21/06
U.S. Cl. 336—83 **8 Claims**



1. A rotary variable differential transformer comprising: an elongated bobbin formed of non-magnetic, non-conductive material; a primary coil wound circumferentially about said bobbin; a secondary coil adjacent said primary coil wound circumferentially about said bobbin and extending longitudinally from a first position proximal said primary coil to a second position distal said primary coil and thereafter returning to said first position; a rotor assembly disposed for rotation within said bobbin; and an elongated ferromagnetic core secured to said rotor assembly for rotation therewith, said core extending longitudinally between said primary and secondary coils and providing magnetic coupling therebetween.

3,882,437

HARMONIC CANCELLATION IN A VARIABLE COUPLING TRANSFORMER

Robert Z. Geller, Mount Kisco, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.

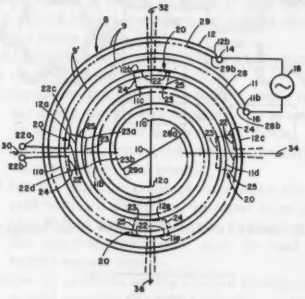
Filed July 13, 1973, Ser. No. 379,142
Int. Cl. H01f 21/04
U.S. Cl. 336—123 **10 Claims**

1. A position-measuring transformer, comprising:

a first winding which defines substantially within a primary plane a pair of concentric spiral conductors of equal and constant pitch with a fixed angular displacement therebetween;

a second winding rotatable with respect to said first winding about the axis of the spiral conductors, said second winding being substantially within a secondary plane parallel to said primary plane and having a pair of arcuate conductors concentric with said first winding, said arcuate conductors having a radial displacement therebetween substantially equal to an integral multiple of one-half of said pitch; and

a third winding which is substantially within said primary plane concentric with said first winding and is defined by spiral conductors having said equal and constant pitch and said fixed angular displacement between each other, corresponding conductors of said first and third windings having a known angular displacement therebetween for the cancellation of a spatial harmonic of a spatial fundamental of a signal provided through said second winding in response to a carrier signal being provided to said first and third windings concurrently with said relative rotation where said known angular displacement is in accordance with a relationship which is given as:



$$\theta = K \frac{360}{2n}$$

where

θ is said known angular displacement in degrees;

K is an odd integer; and

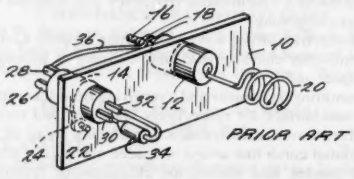
n is the order of the cancelled spatial harmonic component.

3,882,438

COMBINATION TERMINAL AND FUSE HOLDER ARRANGEMENT FOR AN ELECTRICAL CIRCUIT

Howard L. Bourner, Nashville, Tenn., assignor to Pep Industries, Inc., Nashville, Tenn.

Filed Apr. 5, 1974, Ser. No. 458,441
Int. Cl. H01h 85/16
U.S. Cl. 337—237 **8 Claims**



1. A combined terminal and fuse holder adapted to project through an aperture of a supporting plate associated with an electrical circuit arrangement, such as an open coil heater assembly, comprising:

an insulator element having a plurality of passages extending therethrough;

a first electrically conductive element positioned within one of said passages and having a contact portion extending beyond one side of the insulator element;

a second electrically conductive element positioned within another of said passages;

a fuse located on the opposite side of said insulator element from the contact portion of said first conductive element, the fuse being connected between said first and second conductive elements;

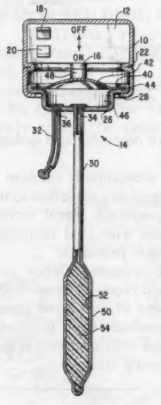
conductive means joined to said circuit arrangement and projecting through said insulator element; and

means located on said one side of the insulator for removably securing said conductive means in contact with the second conductive element whereby the terminal and fuse holder are separated from the circuit arrangement when the conductive means is disconnected from said second conductive element.

3,882,439
THERMAL RESPONSIVE SWITCH DEVICE

Denis G. Wolfe, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 5, 1973, Ser. No. 412,843
Int. Cl. H01h *37/40*
U.S. Cl. 337—326 **13 Claims**



1. A thermal responsive switch device comprising

electrical contact means for controlling a circuit,

means forming a chamber,

a charge of gas in the chamber,

a quantity of porous adsorbent carbonaceous material including a decomposed synthetic polymer selected from the group consisting of decomposed polyvinylidene chloride and decomposed polyvinylidene fluoride in the chamber capable of adsorbing a quantity of the charge of gas, which quantity of adsorbed gas varies inversely with the temperature of the adsorbent material, and

movable means responsive to a gas pressure within the chamber equal to atmospheric pressure for operating the contact means,

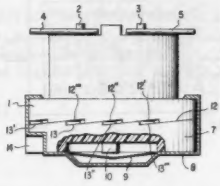
said movable means being in an unoperated position when gas pressure within the chamber is less than a predetermined pressure which is less than atmospheric pressure, and

said charge of gas at temperatures below a predetermined temperature of operation having a pressure which is sufficiently less than atmospheric pressure to normally maintain the movable means in the unoperated position.

3,882,440
THERMOSTAT AND METHOD OF ADJUSTING THE SAME

Walter Hollweck, and Karlheinz Eberl, both of Nurnberg, Germany, assignors to Inter control, Hermann Kohler Elektrik GmbH & Co. KG, Nurnberg, Germany

Filed Aug. 1, 1973, Ser. No. 384,506
Claims priority, application Germany, Aug. 1, 1972, 2237815
Int. Cl. H01h *37/52*
U.S. Cl. 337—354 **8 Claims**

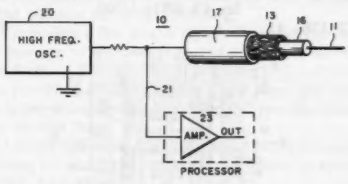


1. In a thermostat having a first and a second housing portion each having an axis, securing means for holding the two housing portions together, a circuit breaker held in the first housing portion, a snap action temperature sensor held in the second housing portion, an insulating actuating member coupling the temperature sensor to the circuit breaker, the improvement comprising at least one pair of camming faces, said pair being formed of two mutually engaging cooperating faces, one belonging to the one housing portion and the other belonging to the other housing portion, said camming faces being arranged for varying the axial spacing of the two housing portions and the distance between said circuit breaker and said temperature sensor upon coaxial rotation of the two housing portions with respect to one another.

3,882,441
RESPONSE NEGATIVE MAGNETOSTRICTIVE WIRE FOR AN INTRUDER DETECTOR

James O. Holmen, and Vahram S. Kardashian, both of Hennepin, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Apr. 24, 1974, Ser. No. 463,488
Int. Cl. G01b *7/16*
U.S. Cl. 338—6 **17 Claims**



1. An improved sensitivity plated wire for use in an intrusion detection system which uses as a tranducer an extended length of strain responsive anisotropic negatively magnetostrictive thin film plated wire, the improved wire comprising:

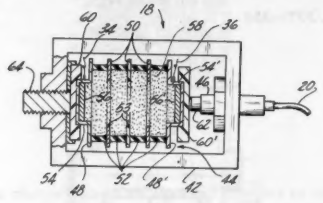
an extended length of conductive wire substrate,

a strain responsive anisotropic negatively magnetostrictive thin film deposit on said substrate, said film having a relatively low original average anisotropy field H_k of about 3 Oe., a dispersion in H_k which is low, and a coefficient of magnetostriction in the range from about −15,000 Oe. to about −20,000 Oe.

3,882,442
TRANSDUCER DEVICE FOR ELECTRICALLY OPERATED BRAKES

Harold C. Hubbard, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 322,946, Jan. 12, 1973, Pat. No. 3,823,985. This application May 20, 1974, Ser. No. 471,187
Int. Cl. H01c *13/00*
U.S. Cl. 338—41 **11 Claims**

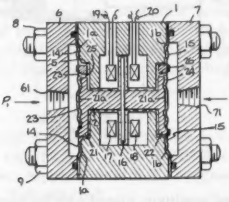


1. A pressure responsive variable electrical resistance control device comprising a flexible bellows having a chamber therein and capable of being contracted and expanded in a given direction in response to forces applied oppositely thereto in said direction, a pair of electrically conductive contacts associated with said bellows and having conductive surfaces exposed within said chamber and disposed in spaced relation from one another along said given direction, a powdered magnetic material received in said bellows chamber between and in engagement with both of said conductive surfaces of said electrically conductive contacts, and means providing a magnetic field having lines of magnetic force extending within said bellows chamber generally in said given direction, whereby contraction of said bellows in response to said applied forces compresses said powdered magnetic material received in said bellows and thereby decreases the electrical resistance between said conductive contacts in proportion to the value of the applied forces and vice versa, and the lines of magnetic force tend to loosen or break up any compacting or adhesion of said powdered material upon reexpansion of said bellows in response to diminution of said applied forces.

3,882,443
DIFFERENTIAL PRESSURE TRANSDUCER

Saichiro Mortia, Tokyo, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed June 6, 1973, Ser. No. 367,411
Claims priority, application Japan, June 30, 1972, 47-77936
Int. Cl. H01c *13/00*
U.S. Cl. 338—42 **8 Claims**



1. A differential pressure transducer comprising:

A. a main body formed with opposing end faces and a passage extending therebetween, the passage being filled with a non-compressible liquid;

B. a pressure-sensing diaphragm mounted closely adjacent each end face of the main body to define a narrow space therebetween, said liquid also filling said space;

C. a rod extending through the passage and terminating at either end in discs having end faces, the diaphragms being secured to the peripheries of the discs whereby the rod is axially displaced in accordance with differential-pressure applied to the diaphragms;

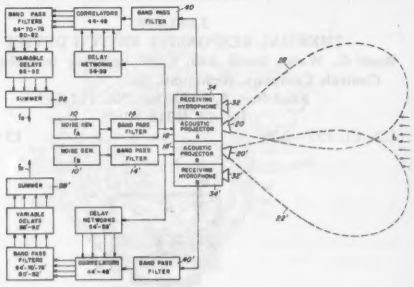
D. at least one temperature-compensating diaphragm disposed closely adjacent one of said end faces to define a narrow space therebetween, liquid from the passage being led to said space whereby this diaphragm serves to absorb the expansion or contraction of the liquid in the passage as a result of ambient temperature changes; and

E. means coupled to said rod to translate the axial displacement thereof into an electrical output signal.

3,882,444
STEERABLE PARAMETRIC CONVERSION ARRAY

Thomas M. Robertson, Silver Spring, Md., assignor to Automation Industries, Inc., Silver Spring, Md.

Filed June 18, 1971, Ser. No. 154,501
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 C **15 Claims**



1. The method of detecting and isolating incoming acoustic waves comprising:

a. generating a substantially random noise signal and projecting said signal in a direction to intersect said incoming waves, said projected signal forming a listening beam which interacts with said incoming waves to produce cross-modulation products;

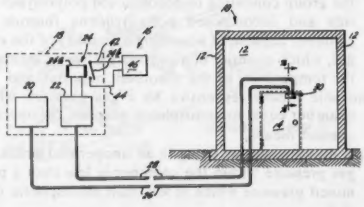
b. receiving said cross-modulation products; and

c. correlating said received cross-modulation products with delayed replicas of said noise signal whereby the cross-modulation products from selected segments of said listening beam are obtained, said selected segments forming a virtual receiving array.

3,882,445
COMPRESSION-WAVE ALARM SYSTEM

Clarence L. Hamilton, Longview, Wash., assignor to Crown Zellerbach Corporation, Camas, Wash.

Filed Sept. 24, 1973, Ser. No. 400,187
Int. Cl. H04b *11/00*
U.S. Cl. 340—15 **6 Claims**



1. A compression-wave alarm system for detecting an intrusion at a selected location in a facility through detecting rela-

tive movement between parts in the facility which parts move relative to one another with an intrusion at said location, said system in operative condition comprising

conduit means defining a space independent of open space within said facility adapted to contain a compression-wave-transmitting medium,

generating means operatively coupled to said conduit means for producing in any such medium contained in said conduit means a compression wave having a predetermined characteristic,

receiving means operatively coupled to said conduit means for receiving a compression wave carried in said conduit means,

compression-wave disturbing means forming a portion of said conduit means, in the effective conduction path therein coupling said generating and receiving means, and operatively coupled to said parts, said disturbing means on the occurrence of an intrusion at said selected location, disturbing and thereby altering the characteristics of a compression wave produced by said generating means and carried in said conduit means through modifying the effective conduction path coupling the generating and receiving means, and

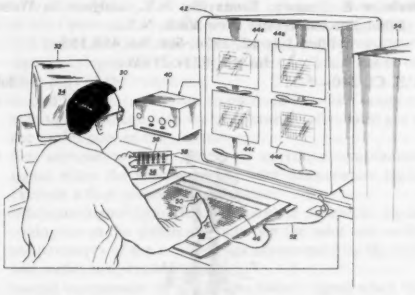
output means operatively connected to said receiving means for producing an output signal on said receiving means receiving a compression wave having characteristics differing from said predetermined characteristics.

3,882,446

INTERACTIVE HORIZON BUILDING, ANALYSIS AND EDITING

Ronel W. Brittian, Dallas; Falvey L. Malarcher, Plano, and William A. Schneider, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1971, Ser. No. 214,145
Int. Cl. G01v *1/28, 1/34;* **G06f** *3/14*
U.S. Cl. 340—15.5 DS **6 Claims**



5. A seismic data selective display system comprising:

a data tablet having a surface for receiving a two dimensional graph of primary horizon segment data and including a stylus movable relative to said surface for generating electrical signals representative of a desired location of a horizon data on said two dimensional graph,

means for storing electrical representations of said horizon segment data including means for generating electrical position signals representative of selected portions of said horizon segment data,

first display means responsive to said electrical position signals for displaying horizon segment data including means responsive to said electrical signals generated by said stylus for displaying lines traced by movement of said stylus over said two dimensional graph and said data tablet surface,

a function key box interconnected to said display means which includes a plurality of switches for the selection of portions of the displayed horizon segment data,

second display means for displaying a depth point-RMS velocity profile for all horizon segments on said first display means,

third display means for displaying depth point-interval velocity data for the earth section between the horizons on said first display means,

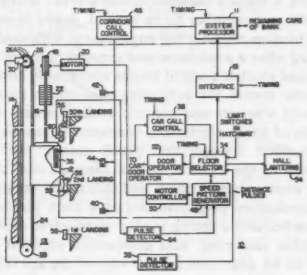
operative means connected to said second and third display means for reflecting the deletion of data corresponding to the nonselected horizon segment data.

3,882,447

HALL LANTERN APPARATUS FOR ELEVATOR SYSTEM

Clyde A. Booker, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1973, Ser. No. 358,428
Int. Cl. B66b *3/02*
U.S. Cl. 340—21 **15 Claims**



1. An elevator system comprising:

a building having a plurality of floors,

an elevator car mounted for movement in said building to serve the floors,

means providing a position signal responsive to the location of the elevator car in said building,

means providing a first enable signal when said elevator car is preparing to stop at a floor and provide up service for that floor,

means providing a second enable signal when said elevator car is preparing to stop at a floor and provide down service for that floor,

up and down indicating means disposed at the floors of the building for which the elevator car provides up and down service, respectively,

a matrix having first and second sets of conductors and associated drivers,

each of said up and down indicating means being connected between predetermined conductors of said first and second sets of conductors,

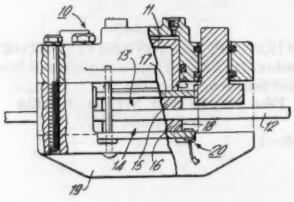
each of said drivers being responsive to said position signal and each of the drivers associated with one of the sets of conductors being responsive to one of said first and second enable signals, to selectively activate predetermined drivers associated with the first and second sets of conductors and energize an indicating means according to the floor at which the elevator car is preparing to stop and the service direction to be served by the car.

3,882,448

BRAKE LINING WEAR INDICATOR

Jyuichi Shibatani, and Sadayoshi Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 7, 1973, Ser. No. 357,898
Claims priority, application Japan, Oct. 14, 1972, 47-10309
Int. Cl. B60r 25/10
U.S. Cl. 340—52 A 9 Claims



1. In a brake lining wear indicator comprising a member to be braked, a friction member having a brake lining for engagement with said member to be braked, probe means mounted on said friction member for engagement with said member to be braked after a predetermined amount of lining wear, alarm means, and electric control means operatively connected with said probe means for activating said alarm means, the improvement wherein said electric control means comprises a transistor of which the base is connected to an electric source and grounded through said probe means, the collector is connected to the electric source through said alarm means and the emitter is grounded, and said probe means comprises a non-conductive plug mounted on a back plate of said friction member and a spring loaded conductive element assembled within said plug, said conductive element including a portion to be disconnected by way of the frictional engagement with said member to be braked, said portion of the disconnected projecting within said plug from the front face of said back plate correspondingly to the predetermined amount of lining wear and remaining disconnected after said frictional engagement with said member to be braked, and said conductive element being disconnectably secured at one end thereof on the portion of said plug projecting from the front face of said back plate and previously biased at the other end thereof inwardly within said plug by a compressed resilient means interposed between a stopper for receiving the other end of said conductive element and the interior wall of said plug thereby to pull said conductive element inwardly upon disconnection of said conductive element.

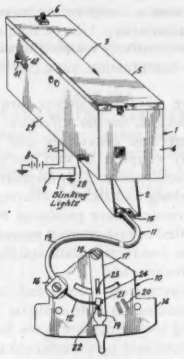
3,882,449

VEHICLE AUTOMATIC EMERGENCY SIGNALLING SYSTEM

Cyrille Bouchard, and Roland Bouchard, both of Rang 9, St. Honore, Quebec, Canada

Filed Oct. 4, 1973, Ser. No. 403,680
Int. Cl. B60q 1/44
U.S. Cl. 340—52 H 13 Claims

1. A vehicle automatic emergency signalling system comprising, in combination, an electrical circuit independent of the other vehicle circuits and including emergency signalling lights adapted to be mounted on a vehicle, a normally open inertia switch adapted to be mounted on the vehicle and series-connected to the signalling lights to close the circuit to the same only when deceleration of the vehicle occurs above a minimum, a time delay system associated with said inertia switch to delay the opening of said switch after the latter has closed upon rapid deceleration of the vehicle in which the system is mounted, a container housing said inertia switch and said time delay system, said container adapted to be secured to a vehicle, said inertia switch including an upstanding support lever pivotally mounted within said container at its lower end, an inertia mass fixed to the upper end of said support lever for causing pivoting of the same in a given direction upon deceleration of the vehicle, switch contact means mounted in said container adjacent said support lever and engageable by said support lever in a rest position of the latter to open the contacts of said switch contact means, said support lever, when pivoting away from said rest position, allowing closing of said contact means, spring means urging said support lever towards said rest position, said time delay system including a link connected to said support lever at one end and means mounted in said container connected to the other end of said link and restraining the movement of said link under the action of said spring means.

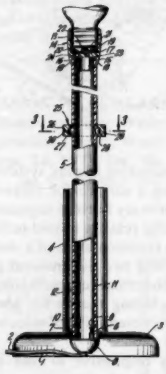


3,882,450

LAMP

Webster E. Janssen, Bronxville, N.Y., assignor to Webster Elliot Janssen, trustee, New York, N.Y.

Filed July 12, 1974, Ser. No. 488,105
Int. Cl. F21v 21/08
U.S. Cl. 240—52.1 9 Claims



1. An improved lamp structure comprising:
a. a base section;
b. a shaft of insulating material located on said base section and extending upwardly from said base section;
c. bus bar conductors embedded in a surface of said shaft, running lengthwise of said shaft, electrically connected to

electricity carrying means which extend out of the lamp structure, and exposed sufficiently at the upper portion of said shaft so as to be able to make electrical contact with the snap conductive contacts of a light bulb socket;

d. a light bulb socket contained within housing of insulating material, said housing being fit over the upper portion of said shaft;

e. snap conductive contacts affixed to and extending below said socket and making electrical contact with said bus bar conductors and said shaft, said snap conductive contacts also making electrical contact with a spring contact in said socket adapted to transmit electric current to an electric bulb when said bulb is inserted into said socket so as to depress said spring contact;

f. switching means for regulating current flow through said bus bar conductors to said light bulb socket.

3,882,451

VEHICULAR CATALYTIC CONVERTER FAILURE ALARM SYSTEM

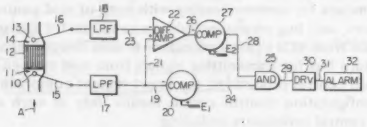
Takeshi Fujishiro; Kenji Masaki, both of Yokohama, and Kiyoshi Wazawa, Fujisawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Sept. 13, 1973, Ser. No. 396,683

Claims priority, application Japan, Sept. 14, 1972, 47-92275

Int. Cl. B60q *1/00*

U.S. Cl. 340—57 **8 Claims**



1. A catalytic converter failure alarm system for a catalytic converter installed in a motor vehicle exhaust system which has an inlet port and an outlet port; the system comprising;

a first temperature sensor to produce an inlet temperature signal analogous to the temperature of exhaust gas at the inlet port of the converter;

a second temperature sensor to produce an outlet temperature signal analogous to the temperature of exhaust gas at the outlet port of the converter;

a first comparator to produce an operating temperature signal when the voltage of the inlet temperature signal exceeds a first predetermined value;

a difference signal amplifier to produce a difference signal analogous to the difference between the inlet and outlet temperatures of the converter as represented by the inlet and outlet temperature signals;

a second comparator to produce a failure signal when the voltage of the difference signal is below a second predetermined value;

an AND gate to produce an alarm signal when the operating temperature signal and the failure signal are applied simultaneously thereto; and

an alarm which energizes in response to the alarm signal.

3,882,452

AUTOMATIC CONTROL OF HEADLIGHTS, TAIL LIGHTS, PARKING LIGHTS AND EMERGENCY WARNING FLASHER LIGHTS FOR VEHICLES

Walter R. Stevens, 2294-A Pacific Ave., Costa Mesa, Calif. 92627

Filed July 29, 1974, Ser. No. 492,420

Int. Cl. B60q *1/26*

U.S. Cl. 340—60 **8 Claims**

1. An automatic light switching system for vehicles employing an automobile battery, headlights, tail lights and flasher lights and employing:

a manually operated light switch for connecting said headlights and said tail lights across said battery for controlled energization thereof,

an ignition switch having first and second terminals, said first terminals being connected to said battery, and

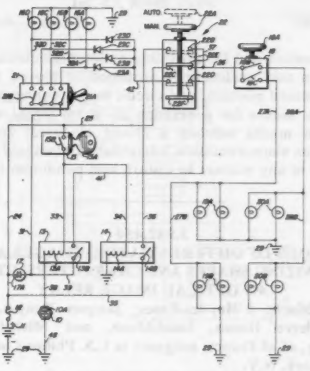
a warning flasher light switch having first and second terminals, said first terminal of said flasher light switch being connected to said battery and said second terminal of said flasher light switch being connected to said flasher lights, the improvement comprising:

an automatic warning switch,

said warning switch comprising a pair of contacts mounted within a housing defining a cavity and interconnected in one position by a bridging contact member,

a diaphragm positioned within said cavity housing for dividing it into two chambers,

means for connecting one portion of said cavity to an oil line of the vehicle engine and the other cavity to a vacuum line of the engine,



whereby the loss of vacuum and oil pressure closes the switching means and running of the engine generates oil pressure and vacuum thereby opening said switching means,

one terminal of said warning switch being connected to ground and the other terminal being connected to relay means,

relay means comprising a solenoid coil and a pair of switching contacts,

one terminal of said coil being connected to said other terminal of said warning switch and the other terminal of said coil being connected to the other terminal of said ignition switch,

one contact of said relay means being connected to said battery and the other contact being connected to said flasher lights,

whereby when said ignition switch is closed and said oil pressure and vacuum is low indicating engine stalling or stopping said warning switch is closed, said switching contacts are closed and said flasher lights are energized.

3,882,453

VEHICLE MOVEMENT SENSITIVE ALARM

Carmela Mule, 249 12th St., Brooklyn, N.Y. 11215

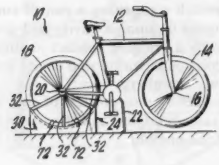
Filed Sept. 24, 1973, Ser. No. 400,022

Int. Cl. B60r *25/10*

U.S. Cl. 340—65 **10 Claims**

1. An alarm in combination with a bicycle comprising a tamper-proof enclosure, said enclosure being elongate and provided with two substantially opposing surfaces, one of said surfaces being circularly curved to follow the contour of an adjoining bicycle wheel and the other of said opposing sur-

faces being planar and suitable for abutting against a flat portion of the ground when the bicycle is parked and said enclosure is disposed below the wheel, pendulum means including a freely movable pendular member arranged within said enclosure for providing an open electrical connection when said enclosure is stationary and disposed in a predetermined position and for providing a closed electrical connection when said enclosure is disturbed or moved from said predetermined position; and circuit means connected to said pendulum means for generating an alarm signal when said pendulum means exhibits a closed electrical connection, whereby an alarm condition is established when said enclosure is moved in any manner to disturb said pendulum means.

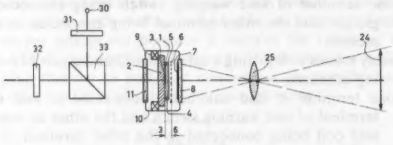


3,882,454

METHODS OF DIFFERENTIATING IMAGES AND OF RECOGNIZING SHAPES AND CHARACTERS, UTILIZING AN OPTICAL IMAGE RELAY

Gerard Marie, L'Hay-les-Roses; Jacques Donjon, Yerres; Jean-Pierre Hazan, Saint-Maur, and Michel Grenot, Brunoy, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1973, Ser. No. 329,236
Claims priority, application France, Feb. 3, 1972, 72.03620
Int. Cl. H01j *39/12*
U.S. Cl. 340—146.3 Q **8 Claims**



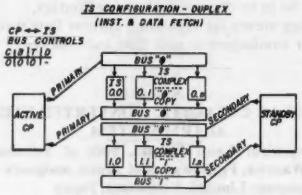
1. A method of optically differentiating images using an optic relay of the type wherein a second image projected on a photosensitive layer is subtracted from a first image projected on the photosensitive layer by reversing the polarity of an applied bias voltage during the projection of said second image, the method comprising projecting an image on the photosensitive layer, reversing the polarity of said applied bias voltage, incrementally shifting said image, projecting the incrementally shifted image with an effective intensity equal to $1/n$ times the absolute value of said first projected image, shifting the incrementally shifted image by an additional increment equal to said first increment, projecting said additionally shifted image on saisd photosensitive layer with an effective intensity equall to the effective intensity of said d first incrementally shifted image, and repeatedly shifting and projecting said incrementally shifted images until a total of n incrementally shifted images have been projected, whereby an approximation of a second derivative of said image is obtained.

3,882,455

CONFIGURATION CONTROL CIRCUIT FOR CONTROL AND MAINTENANCE COMPLEX OF DIGITAL COMMUNICATIONS SYSTEM

Dennis A. Heck, Franklin Park; Rolfe E. Buhrke, La Grange Park; John J. Mele, Chicago; Verner K. Rice, Wheaton, and Donald L. Schulte, Oak Park, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 14, 1973, Ser. No. 397,452
Int. Cl. G06f *15/16, 11/00*
U.S. Cl. 340—146.1 BE **11 Claims**



1. In a digital communications system having duplicate copies of central data processors wherein only one central processor is active at one time and the other is standby, and duplicate copies of storage means each having an associated bus means for communicating with both of said central processors, said bus means including a send bus for transmitting signals from said central processor to said storage means and a return bus for transmitting signals from said storage means to said central processors, the improvement comprising:

configuration control circuit means only in each of said central processors including

active unit bistable circuit means for governing which of said central processors is active and which is standby on a mutually exclusive basis;

central processor trouble bistable circuit means responsive to program control signals and to internally sensed conditions for generating a trouble level signal representative of its associated central processor having sensed a malfunction therein for inhibiting the transmission of its associated central processor to said transmit bus upon detection of a malfunction; and

central processor-storage means bus configuration control logic circuit means including

storage means C bistable circuit means responsive to program signals and to internal malfunction signals for generating output signals defining which copy of said storage means bus means is primary and which is secondary; and

combinatorial logic circuit means responsive to the output signals of said C bistable circuit means for generating separate multiple bus control output signals.

3,882,456

FAULT-DETECTING SYSTEM FOR A MULTI-CHANNEL RELAY SYSTEM

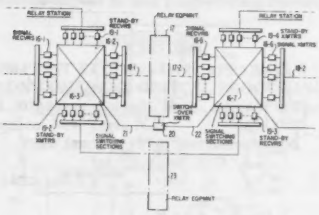
Masami Takada, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 326,191, Jan. 24, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,613
Claims priority, application Japan, Jan. 26, 1972, 47-10027
Int. Cl. H04l *1/00*
U.S. Cl. 340—146.1 R **4 Claims**

1. In a digital transmission system comprising a plurality of relay stations each receiving a plurality of signal channels in parallel, a method for detecting channel faults comprising the steps of:

a. determining a first reference level corresponding to the level of interference signals expected on a channel from neighboring channels,

b. determining a second reference level corresponding to the noise signal level on each channel caused by the circuit components in each channel and



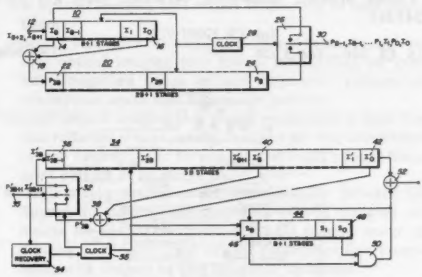
c. at least one relay station, monitoring the incoming signal level for each channel with respect to said first and second reference levels to develop an indication of a fault.

3,882,457

BURST ERROR CORRECTION CODE

John En, Palatine, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 30, 1974, Ser. No. 438,138
Int. Cl. G06f *11/12*
U.S. Cl. 340—146.1 AQ 15 Claims



1. An error correcting system for correcting bursts of errors in a bit stream having an arbitrary burst length up to B bits long, said error correcting system having an encoder for generating parity bits from information bits applied thereto and applying said information bits and said parity bits to utilization means, said encoder comprising:

information bit sample and storage means having B + 1 stages for receiving and storing B + 1 successive information bits;

parity bit generating means connected to the first and last of said B + 1 stages of said information bit sample and storage means, said parity bit generating means including modulo 2 adder means for taking the modulo 2 sum of the information bits stored in said first and last stages of said information bit sample and storage means to thereby generate a parity bit at an output thereof associated with the information bits stored in said first and last stages of said information bit sample and storage means;

parity bit sample and storage means having 2B + 1 stages for receiving and storing 2B + 1 successive parity bits, and and input and an output, said input of said parity bit sample and storage means being coupled to said output of said modulo 2 adder means;

switch means connected to said information bit sample and storage means and the output of said parity bit sample and storage means for alternately transferring information and parity bits respectively therefrom to said utilization means; and

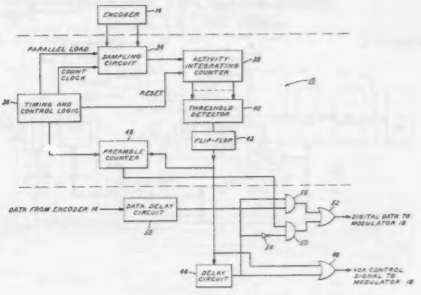
clock means connected to said information bit sample and storage means and said parity bit sample and storage means for successively shifting said information bits and said parity bits between successive stages of said information bit sample and storage means and said parity bit sample and storage means, respectively, said clock means being further connected to said switch means, said switch means being responsive to said clock means for applying one information bit and one parity bit to said utilization means between each shift of information in said information bit and said parity bit sample and storage means.

3,882,458

VOICE OPERATED SWITCH INCLUDING APPARATUS FOR ESTABLISHING A VARIABLE THRESHOLD NOISE LEVEL

David F. Hoeschele, Jr., Norristown, and Eugene H. Barnes, Philadelphia, both of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Mar. 27, 1974, Ser. No. 455,264
Int. Cl. H04b *15/00*
U.S. Cl. 340—146.1 R 28 Claims



1. Apparatus for establishing a variable threshold noise level, said apparatus comprising:

first means for selecting the largest data word from a first predetermined number of sequentially received data words;

second means connected to receive said largest data word and for accumulating a second predetermined number of said largest data words to form a summed data word;

third means connected to receive said summed data word and for selecting the smallest of said summed data words detected during a first predetermined time period; and

fourth means connected to receive and store said smallest of said summed data words for use as a threshold noise level.

3,882,459

DEADTRACKING SYSTEM

George J. Barlow, Tewksbury, and Donald R. Taylor, Framingham, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

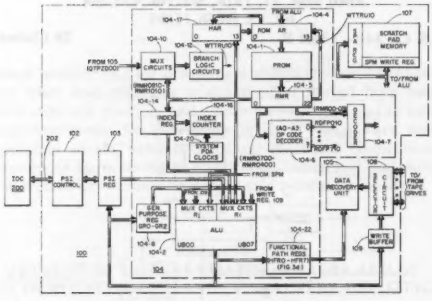
Filed May 2, 1974, Ser. No. 466,438
Int. Cl. G06k *5/00*
U.S. Cl. 340—146.1 F 20 Claims

1. Apparatus for detecting inactivity in a plurality of tracks of a medium read by a device and applied to a corresponding number of channels of a data recovery system, each of said channels including a number of series coupled deskew buffer registers including first and second bistable storage means and clocking means, said first and second bistable storage means of at least a first one of said buffer registers of each channel being coupled to said clocking means for receiving of clocking signals defining bit intervals for sampling information signals read from said tracks during said intervals and each byte of

information corresponding to a group of bit signals simultaneously recorded on said tracks of said medium and then applied by said device as signal transistions to said channels, said apparatus comprising:

a plurality of input transition detector means, the input detector means of each channel being operative in response to said signal transitions to produce pulses representative of a binary ONE and a binary ZERO to first and second lines respectively coupled to said first and second bistable storage means of said first one of said buffer registers;

a plurality of activity circuit means corresponding in number to said input detector means, each coupled to said first and second lines of a different one of said plurality of said input detector means and being operative to switch from a first to a second state in response to pulses applied to said first and second lines;



a corresponding number of bistable channel failure indicator means, each coupled to a different one of said activity circuit means and to a corresponding one of said clocking means of said channel; and,

control means being operative upon detecting that an initial group of bytes have been received from said device to generate signals for enabling each of said clocking means for generating said sets of clocking signals, said control means being coupled to each of said channel failure indicator means and operative to condition said each channel failure means concurrent with generating said signals to be switched from a first to a second state only when said activity circuit means is in said first state for inhibiting the enabling of said channel clocking means by said signals to prevent transfer of incorrect information through each channel of an inactive track.

3,882,460

SERIAL TRANSFER ERROR DETECTION LOGIC

Walter Scott Bennett, Jr., Diamond Bar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 2, 1973, Ser. No. 412,353

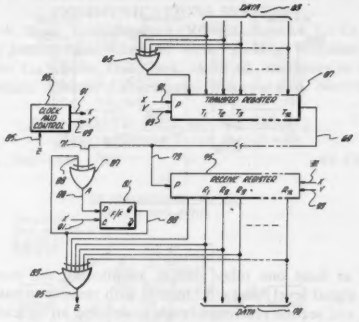
Int. Cl. G06f *11/10*

U.S. Cl. 340—146.1 AG **20 Claims**

1. Error detection logic for a serial transfer channel having a single transmission path and utilizing a parallel input, serial output transfer register at one end and a serial input, parallel output receive register at the other end, comprising:

means for generating an overall parity bit in response to all the bits in said transfer register during each transfer cycle; means for checking parity of all the bits in said receive register during each transfer cycle in response to the bits in said receive register and the overall parity bits received from said overall parity bit generating means; and

means for transferring the overall parity bits from said



parity bit generating means to said parity checking means separately from the bits in said transfer register.

3,882,461

SCANNING DEVICE

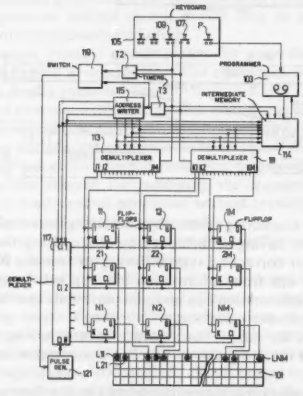
Antonius Vinnemann, and Axel Johner, both of Stuttgart, Germany

Filed Sept. 27, 1973, Ser. No. 401,537

Claims priority, application Germany, Sept. 27, 1972, 2247261

Int. Cl. G09f *9/32*

U.S. Cl. 340—146.3 ED **19 Claims**



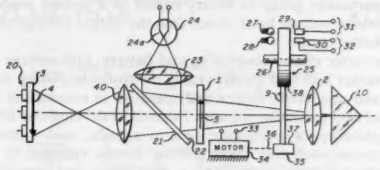
1. Equipment for line-by-line scanning of a drawing and for feeding the data obtained by scanning to a programming memory, the drawing consisting of lines and columns of dots, each having at least one of several different properties, comprising in combination means for providing electrical signals corresponding to a selected property of said dots, an intermediate memory for temporary storage of at least as many signals as are obtained by scanning all of the dots in one line having the same selected property, a plurality of visual checking elements mounted immediately adjacent the dots of a line and equal in number at least to the number of dots in one line and having the same spatial configuration as the dots of the line so that each visual checking element is associated with its own dot, a programming memory, input means connected with said programming memory for supplying the signals stored in said intermediate memory to said programming memory, and test means connected to the checking elements to apply to the

checking elements, a visual signal for verification of the electrical signals obtained by scanning the dots associated with said checking elements stored in said intermediate memory prior to being supplied to said programming memory.

3,882,462
FINGERPRINT RECOGNITION APPARATUS USING NON-COHERENT OPTICAL PROCESSING

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 438,130
Int. Cl. G06k *9/13*
U.S. Cl. 340—146.3 E **22 Claims**



1. An optical fingerprint pattern identification apparatus comprising:

means for optically illuminating a fingerprint pattern to be identified to produce an optical beam representative of said fingerprint pattern,

first optical imaging lens means responsive to said optical beam,

reflector means for returning said optical beam through said first optical imaging lens means for forming an erect, unity-magnified image of said fingerprint pattern superimposed upon said fingerprint pattern,

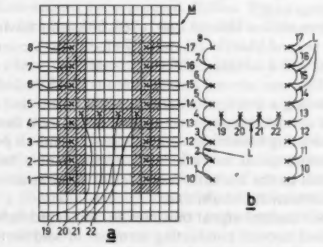
second optical imaging lens means responsive to light from said reflector means passing between the line components of said fingerprint to form a second image of said fingerprint pattern at an image plane, and

selector means having a reference direction between said fingerprint pattern and said first optical imaging lens means for spatial modulation of said second image according to the direction of said fingerprint line components with respect to said reference direction.

3,882,463
CHARACTER RECOGNITION APPARATUS

Ronald Howard Britt, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 262,142, June 12, 1972, abandoned.
This application Mar. 18, 1974, Ser. No. 451,780
Claims priority, application United Kingdom, June 14, 1971, 27679/71
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3 AC **16 Claims**



1. A method of character recognition comprising the steps of:

a. comparing a complete character with each member of a set of masks corresponding to a set of complete characters which may contain such complete character, each mask comprising discrete mask elements set in predetermined relative positions corresponding to selected parts of the associated complete character;

b. linking the mask elements into groups only along selected parts of the associated complete character;

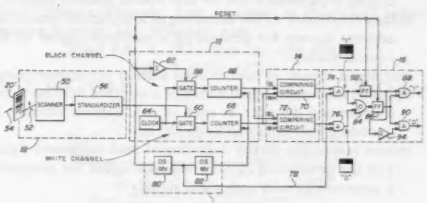
c. detecting a fit of each such linked group with a complete character, by applying a fit criterion in which at least a predetermined fraction of the elements of the mask group along a selected part of the associated complete character fits the complete character; and

d. indicating a fit of the complete character with the mask when a selection of the groups of mask elements thus fit such complete character.

3,882,464
SIZE RATIO LABEL READING SYSTEM

Stanley F. Zamkow, North Abington, Mass., assignor to Computer Identics Corporation, Westwood, Mass.

Filed Apr. 4, 1974, Ser. No. 457,796
Int. Cl. G06k *9/18*
U.S. Cl. 340—146.3 Z **2 Claims**



1. A reading system for reading encoded information and determining whether the ratio of the widths of a pair of segments is within acceptable limits, said encoded information presented in pairs of adjacent segments including a first segment having a first characteristic and a second segment having a second contrasting characteristic, said segments occurring in more than one width, comprising:

sensing means for reading said encoded information and producing a first segment signal representative of said first segment and a second segment signal representative of said second segment;

measuring means, responsive to said first and second segment signals, for providing first and second size signals representative of the widths of said first and second segments, respectively;

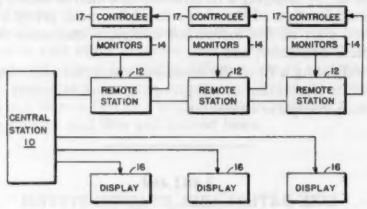
a first function generator, responsive to said first size signal, for producing a first function signal and a second function generator, responsive to said second size signal for producing a second function signal; and

first determining means responsive to the difference between said first function signal and said second size signal for producing a first recognition signal representative of whether the ratio of the widths of said first and second segments is within a first predetermined range and second determining means, responsive to the difference between said second function signal and said first size signal for producing a second recognition signal representative of whether the ratio of the widths of said first and second segments is within a second predetermined range.

3,882,465
REMOTE CONTROL SYSTEM HAVING COMMAND AND ADDRESS SIGNALS

Charles W. Cook, and James T. Odom, both of Huntsville, Ala., assignors to Avco Corporation, Huntsville, Ala.

Filed Dec. 5, 1973, Ser. No. 421,901
Int. Cl. H04q *9/00*
U.S. Cl. 340—147 R **12 Claims**



1. In a signaling system having a central station and a plurality of remote transponding stations, the combination comprising:

signal transmitting means at said central station for transmitting coded address signal to said remote stations;

an address decoder at each of said remote stations for decoding a particular one of said coded address signals;

means responsive to the decoding of a particular one of said address signals for generating a response signal to said central station;

command means at said central station for transmitting a coded command signal ahead of a selected address signal;

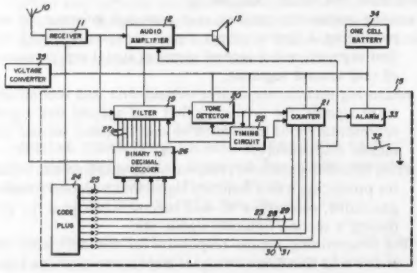
a command decoder at each of said remote stations for decoding said command signals; and

means responsive to the decoding of said command signals and the generation of said response signal for generating a response to said command signal.

3,882,466
SWITCHABLE FREQUENCY TONE DETECTOR WITH ELECTRONICALLY CONTROLLED CODE PLUG AND BCD CONVERTER

Ronald E. Poorvin, Plantation, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 12, 1973, Ser. No. 405,951
Int. Cl. H04q *1/45*
U.S. Cl. 340—171 PF **9 Claims**



1. A switchable frequency tone detector for receiving and passing a plurality of tone signal frequencies in sequence including in combination;

a one cell battery and a voltage converter providing an output voltage greater than the output voltage of said battery,

active filter means including a plurality of field effect transistor switch means each operative in response to one of a plurality of particular control signals of a first predetermined voltage level greater than the voltage of said battery to determine a particular one of the plurality of tone signal frequencies said active filter means couples therethrough,

detector means coupled to said battery and the output of said active filter means and operative in response to each of said tone signals in sequence being coupled thereto to develop a particular sequence signal,

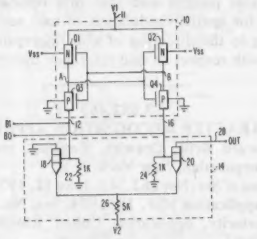
electronically controllable coding means coupled to said battery and said detector means and operative in response to each particular sequence signal to develop a particular group of binary signals at a second predetermined voltage level, lower than the output voltage of said battery, and

converter means coupled to said battery, said voltage converter and said electronically controllable coding means and said switch means and operative in response to each of said particular groups of signals to develop one of said plurality of particular control signals, said converter means including level shifting means coupled to said electronically controllable coding means and operative in response to each signal of said particular group of binary signals to develop a second particular group of binary signals at the first predetermined voltage level and logic circuit means operative in response to each signal in said second particular group of signals at said first predetermined voltage level to develop said particular control signals.

3,882,467
COMPLEMENTARY FIELD EFFECT TRANSISTOR MEMORY CELL

Wilbur David Pricer, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,889
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **12 Claims**



1. A memory circuit having a selected state and a quiescent state, comprising:

a four transistor storage cell, each transistor having a first and second current conducting electrode, a control electrode and a substrate electrode, said storage cell comprising first and second branch circuits, each branch circuit including a first conductivity type transistor and a second type conductivity type transistor having their first current conducting terminals connected to a common point, said common point in each branch circuit also being connected to the control electrodes of the transistors in the other branch circuit, and

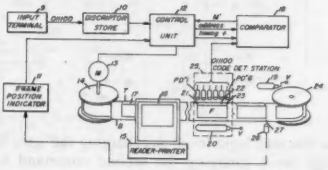
common control signal bias means connected between the second current conducting terminal of said first conductivity type transistor in each branch circuit and its substrate terminal, said bias means providing a first bias condition for sustaining said first conductivity type transistors in enhancement mode during said quiescent state

causing substantially zero current to flow in said branch circuits and providing a second bias condition causing at least one of said first conductivity type transistors to operate in a depletion mode during said selected state causing substantial current to flow in one of said branch circuits.

3,882,468
STORAGE AND RETRIEVAL OF GRAPHIC INFORMATION

Thomas R. Ormsby, Walworth, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,224
Int. Cl. G11b *23/40, 23/38*
U.S. Cl. 340—173 LM **8 Claims**



1. In an information and retrieval system, the combination comprising:

means for producing a first signal representing a descriptor code;

at least one substantially planar record medium which extends to terminate in at least one edge the thickness of said edge being substantially small in relation to the other overall dimensions of said planar record medium, said medium being formed of a light transmitting material which exhibits a lightpipe effect for light within a predetermined range of wavelengths;

means for directing a beam of light, having a wavelength within said range, into said medium at an edge thereof, to travel within the plane of said medium;

means forming a part of said medium for intercepting and modulating said beam in accordance with a preselected code pattern;

means, arranged adjacent to at least one edge of said medium, for receiving said beam and for producing in response thereto a second coded signal representing said modulated code pattern; and

means for receiving said first signal and said second signal, and for comparing the codes represented thereby.

3,882,469
NON-VOLATILE VARIABLE THRESHOLD MEMORY CELL

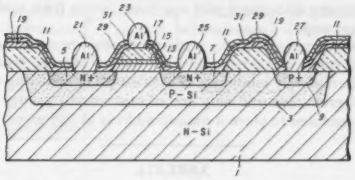
William Milton Gosney, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 203,387, Nov. 30, 1971. This application June 18, 1973, Ser. No. 370,583
Int. Cl. G11c *11/40, 7/00;* **H01l** *11/14*
U.S. Cl. 340—173 R **5 Claims**

1. In the operation of a non-volatile memory cell comprising an insulated gate field-effect semiconductor device having a source and drain and having a gate isolation means including two gate isolation materials, one of which is characterized by the ability to preferentially trap charges of one polarity, the other being characterized by the ability to preferentially trap charges of the opposite polarity, the improved method comprising the steps of:

a. writing into the memory cell by increasing the positive voltage on the drain junction to a level which causes avalanche breakdown, while simultaneously applying a small voltage of source polarity to the gate terminal, thereby driving some of the avalanching carriers through only one of said gate isolation materials whereby a trapped charge is stored at the interface between the two gate isolation materials; then at an appropriate later time

b. erasing the memory cell by increasing the voltage on the gate to a sufficiently high level to initiate injection of

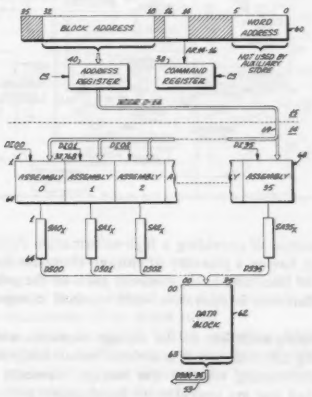


charges of opposite polarity from the gate electrode into the isolation layers, while holding the source, drain and substrate electrodes at substantially ground potential, thereby causing said injection to occur preferentially at the interface between the gate isolation layers, whereby the stored charge at that location is neutralized to restore the threshold voltage to substantially its intrinsic value.

3,882,470
MULTIPLE REGISTER VARIABLY ADDRESSABLE SEMICONDUCTOR MASS MEMORY

John C. Hunter, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Feb. 4, 1974, Ser. No. 439,459
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **20 Claims**



1. An integrated-circuit store comprising a body of semiconductor material having formed thereon a plurality of basic circuits as a common substrate, each of said basic circuits comprising:

a bus portion including at least one signal line sharing address and data information, and a control signal line, said bus portion interconnecting said plurality of basic circuits;

a plurality of first means for storing data signals;

a plurality of second means each capable of storing a different address;

means for enabling one of said plurality of second storage means to store a unique address transmitted over said shared signal line;

means for controlling the transfer of data signals between said shared signal line and one of said first storage means;

means responsive to a comparison between address signals received over said shared signal line and said stored address for actuating said controlling means;

second means for connecting said shared signal line to said actuating means and to said plurality of first storage means;

means for disabling said second connecting means to thereby disconnect said one basic circuit from said signal bus; and

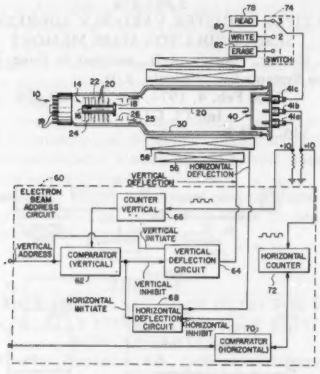
means responsive to the status of all other basic circuits and all other of said plurality of second storage means for alternatively inhibiting or actuating said enabling means, whereby one and only one of said second storage means is enabled to store a unique address at any given time.

3,882,471

APPARATUS AND METHOD OF OPERATING A HIGH-DENSITY MEMORY

John M. Walker, Springfield, Va., and John M. McIntyre, deceased, late of Big Flats, N.Y. (by Betty J. McIntyre, administrator), assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1974, Ser. No. 462,487
Int. Cl. G11c *11/26*
U.S. Cl. 340—173 SP **12 Claims**



1. A method of providing a high-information density, storage device having a plurality of storage elements disposed in a matrix of lines and rows, wherein each of the addressable storage elements is operative, said method comprising the steps of:

a. providing each line of the storage elements with a positioning tab disposed in a defined relationship therewith;

b. determining whether the storage elements within a selected line are operative or inoperative; and

c. if a selected number of storage elements within a selected line is not operative, removing the positioning tab corresponding to that selected line.

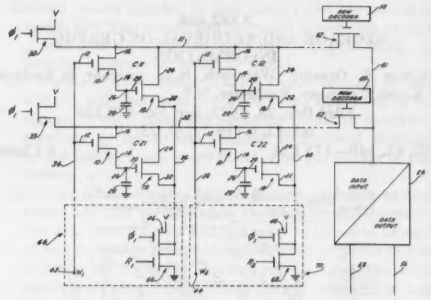
3,882,472

DATA FLOW CONTROL IN MEMORY HAVING TWO DEVICE MEMORY CELLS

Kent F. Smith, Salt Lake City, Utah, assignor to General Instrument Corporation, Clifton, N.Y.

Filed May 30, 1974, Ser. No. 474,391
Int. Cl. G11c *11/24, 11/40, 7/00*
U.S. Cl. 340—173 CA **20 Claims**

1. A method for controlling data flow into a two device memory cell wherein each of the devices have a control terminal and an output circuit, a first command line operably connected to the control terminal of the first device, a storage node, a single data input-output line, the output circuit of the first device being connected between said data line and said node, a second command line, the second device having its output circuit connected between said data line and said second command line and its control terminal connected to said node, the method comprising the steps of charging the



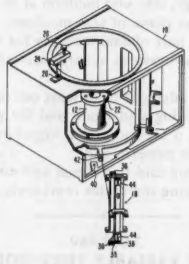
node to a discrete logic level, precharging the data line to a first voltage level, charging the second command line to a second voltage level, the second device being effective, if rendered conductive by the charge on the storage node, to change the voltage level of the data line to the second voltage level such that the resulting voltage level on the data line is representative of the charge on the storage node.

3,882,473

MAGNETIC DISK STORAGE FILE

Henry G. Hoehmann, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1970, Ser. No. 20,781
Int. Cl. G11c *11/02*
U.S. Cl. 360—98 **12 Claims**



1. A fixed head magnetic disk storage file comprising:

a housing;

a drive spindle defining a rotational axis positioned in said housing;

a plurality of magnetic disks mounted coaxially on said spindle, said disks having recording surfaces on which data tracks are formed;

at least one pair of pivotable post structures positioned 180° apart, aligned parallel to and spaced equally from said spindle axis;

a multiplicity of multi-element head assemblies mounted to said post structures, each head assembly having a like number of transducing elements that are aligned radially relative to a respective disk surface, when the post structure is fixed for file operation and data signal transducing; the transducing elements of one post structure and those of the other post structure of said one pair being diametrically opposed and in transducing relation with the same

data tracks to provide parallel data signal operation so that faster access is achieved;

said post structures being pivotable so that said head assemblies may be moved away and precisely back to the same positions such that said transducing elements are accurately aligned with the same data tracks as prior to rotation of the post structures.

3,882,474

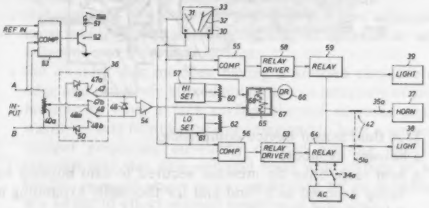
SYSTEM FOR MONITORING THE INSTANTANEOUS VELOCITY OF A PIPE STRING BEING TRIPPED RELATIVE TO A WELL BORE

Lester L. Cain, 4728 W. Alabama, Houston, Tex. 77035

Filed Oct. 4, 1972, Ser. No. 294,841

Int. Cl. G08b *21/00*

U.S. Cl. 340—177 CA **15 Claims**



1. For a drilling system, alarm means for providing an indication whenever predetermined velocity values for travel of a pipe string relative to a borehole are exceeded by actual velocity of pipe being moved relative to a borehole,

means adapted for coupling with a pipe string for generating electrical input signals representative of actual velocity of a pipe string,

said alarm means including selectively operable preset means for establishing a preset condition which is representative of a velocity limit,

means for receiving and correlating input signals to said preset means where such input signals are representative of actual velocity of a pipe being moved relative to a borehole, said correlating means being constructed and arranged for providing an output signal whenever such an input signal reaches a preset condition,

means for receiving said output signal and for producing a physiological indication in response thereto, and

means coupled to said receiving and correlating means for selectively applying only those input signals to said alarm means which represent travel of such pipe in one direction.

3,882,475

CONTROL OF ROOFING PROCEDURE

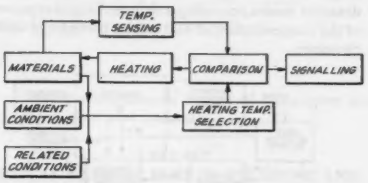
Robert J. Moore, 614 Redman Ave., and Gerald B. Curtis, 50 Gill Rd., both of Haddonfield, N.J. 08033

Filed Dec. 4, 1972, Ser. No. 311,743

Int. Cl. G08b *17/06*

U.S. Cl. 340—227 R **5 Claims**

1. In apparatus for temperature control of molten bituminous material to be used in molten form in formation of built-up roofs, the improvement comprising thermostatic means for sensing the temperature thereof and including switch means operatively interconnected to the thermostatic means, a first circuit establishable through the switch means when the sensed temperature exceeds a high-temperature limit, a second circuit establishable through the switch means when the sensed temperature falls below a low-temperature limit, a common circuit establishable when either temperature limit is exceeded, first signalling means in the first circuit, second signalling means in the second circuit, and third signalling means in the common circuit, wherein the switch means includes a pair of singlepole double-throw switches, each having its respective contacts connectable across an electrical potential source, the respective first and second signalling means being connected with oppositely unidirectional current means



between the respective switch arms, and the third signalling means being connected between the switch arms and one side of the potential source.

3,882,476

ALARM SYSTEM WITH PERIODIC TEST SECTION

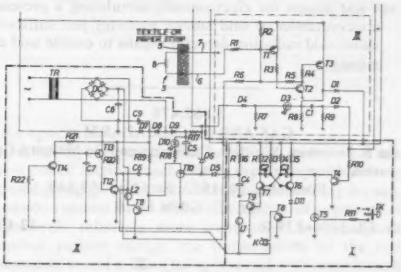
Stig Tore Johannes Lofgren, Taby, Sweden, assignor to Lyckselе Aktiebolaget Impuls Regulator, Taby, Sweden

Filed Apr. 11, 1973, Ser. No. 349,989

Claims priority, application Sweden, Apr. 13, 1972, 4814/72

Int. Cl. G08b *21/00*

U.S. Cl. 340—235 **17 Claims**



1. An alarm system, comprising:

detecting means for producing a change in an electrical parameter from a normal non-alarm value in response to the occurrence of an alarm state;

an alarm state detecting circuit including trigger means connected to said detecting means for providing an output when said electrical parameter has a value beyond a predetermined threshold value;

an alarm signalling circuit for producing an alarm signal in response to the output of said trigger means;

test means for automatically changing said predetermined threshold value to a value beyond said normal electrical parameter value.

3,882,477

SMOKE AND HEAT DETECTOR INCORPORATING AN IMPROVED SMOKE CHAMBER

Peter H. Mueller, 517 S. Gunderson, Oak Park, Ill. 60304

Filed Mar. 26, 1973, Ser. No. 344,532

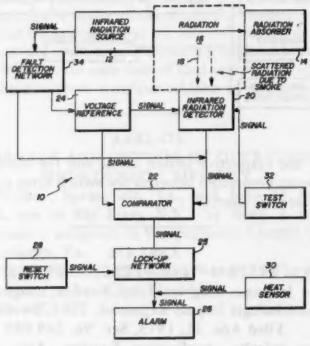
Int. Cl. G08b *17/12*

U.S. Cl. 340—237 S **17 Claims**

1. A smoke detector for detecting the presence of smoke particles within a smoke chamber, said smoke detector comprising:

radiation source means including a radiation emitting semiconductor device for transmitting a beam of radiation within said smoke chamber;

radiation detector means for receiving radiation scattered from said beam by said smoke particles, said radiation detector means providing a detected signal representative of the concentration of said smoke particles in said smoke chamber;



alarm means for generating a warning signal whenever said detected signal indicates that a dangerous concentration of said smoke particles is present within said smoke chamber; and

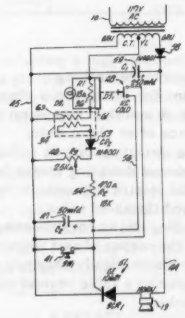
self-test means for electronically simulating a preselected concentration of said smoke particles just sufficient to cause said radiation detector means to enable said alarm means.

3,882,478

GAS AND SMOKE ALARM

John S. Skarman, Whittier, Calif., assignor to Malgard Corporation, Monterey Park, Calif.

Filed May 14, 1973, Ser. No. 359,849
Int. Cl. G08b *17/10*
U.S. Cl. 340—237 R **12 Claims**



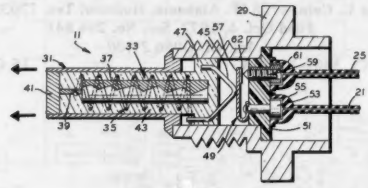
1. A gas and smoke alarm comprising a frame, a semiconductor sensor sensitive to the presence of gas and smoke, a heater for the semiconductor sensor, a signal lamp in series with the sensor, a power source electrically connected to the sensor through the lamp, an alarm horn connected to the power source across the sensor, a reset circuit adapted to restore pre-alarm discontinuity to the horn, means for adjusting the sensitivity setting of the semiconductor sensor; said sensor, heater, lamp and horn being secured to said frame; a cover for the frame, and a heat flue defined by the cover and the frame, said heat flue opening upon at least one of said heater, lamp and semiconductor sensor so as to induce convection flow in the flue for sampling ambient atmosphere.

3,882,479

THERMALLY EXPANSIVE SENSOR

Nikolaus A. Szeverenyi, Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 23, 1974, Ser. No. 435,663
Int. Cl. G08b *21/00*
U.S. Cl. 340—244 R **15 Claims**



1. A fluid sensor device comprising:

a housing member;

a heat responsive tip member secured to said housing for being exposed to a fluid and for thermally expanding in a first direction;

a substantially elongated solid heat responsive member positioned substantially within said sensor device and fixedly positioned relative to said heat responsive tip member for thermally expanding in a second direction opposing said first direction of expansion of said tip member; and

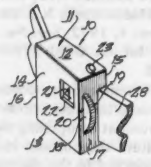
heater means positioned within said sensor device and relative to said tip member and said elongated heat responsive member for heating said tip member and said elongated heat responsive member to cause said tip member to thermally expand in said first direction and said elongated heat responsive member to expand in said second direction, said elongated heat responsive member expanding greater than said tip member only when the temperature of said elongated heat responsive member exceeds the temperature of said tip member, said greater expansion occuring only when said tip member is exposed to said fluid.

3,882,480

CONTACT PACER TIMER

Robert O. Greber, 10144 Dunbarton Dr., El Paso, Tex. 79925

Filed Dec. 26, 1973, Ser. No. 427,817
Int. Cl. G08b *23/00*
U.S. Cl. 340—323 **1 Claim**



1. A pacer-timer device intended to be worn about a portion of an individual's body to provide audible pacing signals to the individual for pacing of the individual's body movements in jogging, walking and running, the device comprising, in combination:

a housing of a rectangular hollow box-like configuration having a flat vertical front surface, a flat vertical back

surface, a flat horizontal top surface, a flat horizontal bottom surface, and opposed vertically extending flat side wall surfaces;

a slot extending longitudinally through said opposed side wall surfaces adjacent said back wall surface and opening out of said side wall surfaces;

an elongated flat rectangularly configured flexible strip like belt of a cross-sectional area to pass freely through said slots of said housing side wall surfaces, said belt intended to pass about an individual's waist for adjustably retaining said housing to the individual's body;

an earphone intended to be worn in an individual's ear and having an electrical cord extending outwardly therefrom;

an earphone jack disposed in said housing top surface adapted to have said earphone cord electrically connected thereto;

a rectangular opening provided in said housing front wall surface and opening into said housing interior;

a slot provided in one of said side wall surfaces adjacentmost said front wall opening and disposed parallel to and adjacent said front wall surface;

a flat circular disc member having a knurled circumferal edge and rotatively affixed about its axis interiorly of said housing to have a face surface thereof disposed rearwardly of said front surface opening and to have a portion thereof projecting outwardly of said housing interior through said slot adjacent said front wall surface to be readily engaged about its circumference by an individual's finger to effect manual rotation of said disc;

a plurality of numerically increasing indicia in the form of indicating numerals sequentially arranged on said front surface of said disc spaced equally about the circumference thereof in positions to be selectively oriented with said front surface opening upon rotation of said disc for visual indication of the relative position of said disc about its axis to an individual wearing said housing;

a source of electrical energy provided by a battery mounted in said housing; an electrical circuit disposed within said housing interior to provide an electrical signal output in the form of timing impulses to said earphone of a selected frequency range, said electrical circuit including a first and second transistor of the NPN type, a third transistor of the PNP type, a first through fourth diode, a first through third capacitor, a first through third fixed resistor, a first variable resistor, a second variable resistor, said first and second transistors defining a multi-vibrator circuit in conjunction with associated ones of said components to provide an output signal of pulses selectable in frequency in the range of from 0.4 seconds to 3.0 seconds, said third transistor receiving said output signal and amplifying the same to energize said earphone coil to provide audible signals in said earphone varying in accord with said output signal; and

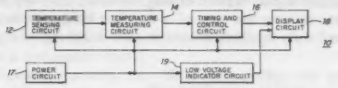
said disc being manually connected to said first and said second variable resistors with rotation of said disc varying the resistance of said variable resistors to effect the tuning of the multi-vibrator circuit in a manner to select the desired frequency output signals.

3,882,481
LOW VOLTAGE INDICATOR CIRCUIT

Robert Bruce Turner, Weymouth, Mass., assignor to American Medical Electronics Corporation, Weymouth, Mass.

Filed May 30, 1974, Ser. No. 474,402
Int. Cl. G08b *5/36*
U.S. Cl. 340—336 **8 Claims**

1. An electronic system comprising a display circuit including at least two display units which are normally simultaneously enabled to display a character during an interval of operation of the system and a low voltage indicator circuit responsive to the supply voltage decreasing below a predetermined level for disabling at least one and less than all of said

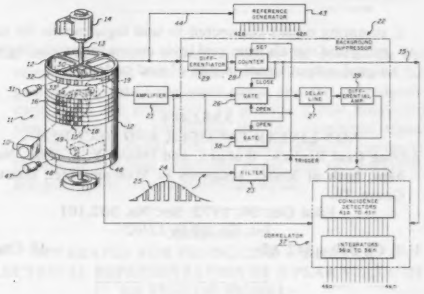


display units and preventing its display of a character during at least a segment of said interval.

3,882,482
OPTICAL RADIANT ENERGY ENCODING AND CORRELATING APPARATUS

Benjamin W. Green, Achuza, Haifa, Israel; Richard E. Roble, Commack, and Irving Roth, Williston Park, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 12, 1969, Ser. No. 862,625
Int. Cl. G01b *11/26*; **G01n** *21/30*
U.S. Cl. 340—347 P **12 Claims**



1. An optical encoder comprising

a member having a continuous loop track including at least two coded sections each having a plurality of bands disposed along the track with each band containing the same pseudo-random code formed by means of segments respectively relatively more transparent and opaque to optical radiant energy, the transmissivity of the code segments in one section being inverted with respect to the corresponding code segments in the other section and the codes in the bands of at least one of the sections being shifted relative to one another whereby the code patterns of the respective sections are skewed relative to one another.

3,882,483
CODE CONVERTER SYSTEM AND METHOD

Edmund T. Burke, West Long Beach, and Donald F. Kennedy, South Toms River, both of N.J., assignors to Electronic Associates, Inc., West Long Branch, N.J.

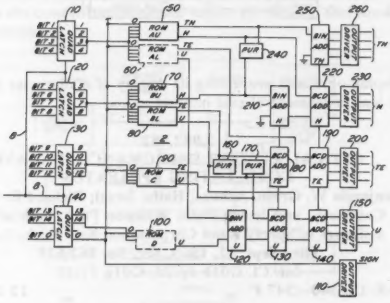
Filed May 7, 1973, Ser. No. 357,624
Int. Cl. H03k *13/24*
U.S. Cl. 340—347 DD **1 Claim**

1. A system for converting digital input signals to digital output signals between binary coded decimal and binary code signals, comprising:

a. hard wired logic means having a programmed mapping between said codes, said logic means having said input signal applied in one of said codes and for producing a signal in the other of said codes, said logic means including a plurality of read only memory means connected each to the other in parallel fashion, each of said read only memory means having a predetermined decade of information applied thereto in said input signal code;

b. storage register means for holding predetermined decades of information signals, said storage register means

applying said signals to said read only memory means, at least one of said storage register means applying an information signal to each of said read only memory means for determining the sign of a number being applied to said read only memory means in said input signal code; and



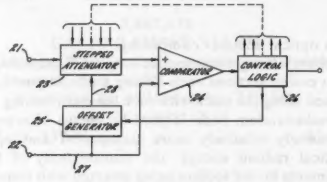
c. summing means connected to said logic means for summing said signals from said logic means for producing said digital output signal in one of said codes.

3,882,484

NON-LINEAR ENCODER AND DECODER

Adrian Paul Brokaw, Woburn, and Daniel Y. S. Chin, Needham, both of Mass., assignors to Wescom, Inc., Downers Grove, Ill.

Filed Oct. 30, 1972, Ser. No. 302,101
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **18 Claims**



13. The encoder of claim 12 wherein said order is selected so that said attenuation factors are multiplicatively contributed to the attenuation level of said attenuator in declining order of significance.

3,882,485

UNIVERSAL POLYBINARY MODEM

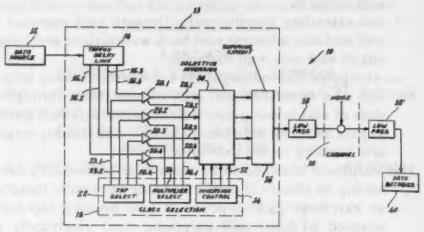
Leo I. Bluestein, Bedford, and John H. Meyn, Carlisle, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 3, 1973, Ser. No. 402,959
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD **11 Claims**

5. A universal polybinary modem for use in a system in which data signals precoded for a desired class of polybinary signals having essentially zero energy at an upper band edge are transmitted along a communications channel at a high baud rate and are decoded at a receiving end of the channel comprising

means for selecting the precoded data signals at successive intervals corresponding to the baud rate employed in the precoded data signals;

means, connected to the output of the selecting means, for arithmetically combining predetermined selected precoded data signals in accordance with a desired class of polybinary signals having a power spectrum of essentially zero at the upper band edge; and



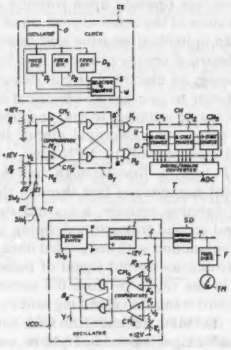
a duobinary wave shaping network in line with the communications channel, the network receiving the output of the combining means and, in conjunction with the selecting and combining means, forming the desired class of polybinary signals.

3,882,486

VARIABLE-FREQUENCY GENERATOR

Nicola Montefusco, and Alfredo Barlucchi, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 9, 1973, Ser. No. 404,749
Claims priority, application Italy, Oct. 6, 1972, 30148/72
Int. Cl. H03k *4/06*
U.S. Cl. 340—347 DA **8 Claims**



1. A system for producing a periodically and linearly varying frequency, comprising:

a generator of uniformly spaced stepping pulses;

a binary counter provided with a forward-counting first input and with a backward-counting second input;

first bistable switch means responsive to the output of said counter for feeding said stepping pulses to said first input until the count exceeds a predetermined upper limit and to said second input until the count drops below lower predetermined lower limit, with switchover from one to the other upon the passing of either of said limits;

a digital/analog converter connected to the output of said counter for translating said count into an alternately rising and falling stepped voltage with steps of uniform width and height;

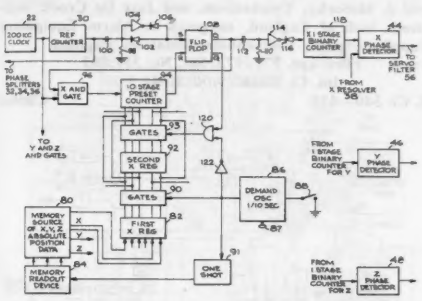
a voltage integrator having a small time constant with reference to the repetition period of said stepping pulses; and second bistable switch means for feeding said stepped voltage to said integrator with periodic polarity reversals in response to attainment of either of two predetermined

voltage levels by the integrator output, thereby producing a substantially triangular wave whose frequency varies with the instantaneous magnitude of said stepped voltage.

3,882,487
ALL DIGITAL SAMPLING SERVO SYSTEM

Jack Rosenberg, 808 Bienveneda Ave., Pacific Palisades, Calif. 90272

Filed Nov. 29, 1973, Ser. No. 419,903
Int. Cl. G08c *11/00;* **H03k** *13/02*
U.S. Cl. 340—347 DA **9 Claims**



1. A numerical control system for commanding slide motion along each axis of a machine tool comprising, for each axis,

means for generating successive absolute location number signals representative of successive locations to which the slide for an axis must move within successive, identical, predetermined intervals,

means for generating successive reference time signals spaced apart by said identical predetermined intervals,

means responsive to successive absolute location number signals and successive reference time signals for generating successive command signals wherein each command signal is phase delayed from a reference time signal by an amount representative of a location number value,

means for generating a slide signal having a phase delayed from said reference by an amount representative of the distance of said slide from a reference location,

a phase detector,

means for successively applying said command signals and said slide signals to said phase detector to produce an output signal having a phase representative of a phase difference of its inputs, and

means responsive to the output of said phase detector for moving said slide in a direction to minimize said phase difference.

3,882,488
ANALOG TO DIGITAL CONVERTER SYSTEM INCLUDING COMPUTER CONTROLLED FEEDBACK MEANS

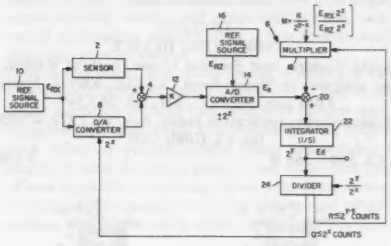
Henry R. Kosakowski, Denville, and Douglas J. Washburn, Morristown, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 26, 1973, Ser. No. 428,156
Int. Cl. H03k *13/00*
U.S. Cl. 340—347 CC **6 Claims**

1. In an analog to digital conversion system of the type including means for summing an analog input signal with a feedback signal from a digital to analog converter to provide an error signal, means for adjusting the gain of the error signal, an analog to digital converter for converting the analog signal to a digital signal, computer means including an integrator for integrating the digital signal and for providing a digital output corresponding to the analog input signal and divider means for dividing the integrated digital signal by a predetermined scale factor signal, the digital to analog converter connected to the divider means for converting the signal therefrom to an analog signal which scales the integrator to said converter, the improvement comprising:

the signal from the divider means including a quotient signal and a remainder signal;

the digital to analog converter converting the quotient signal to an analog signal which scales the integrator to said converter;

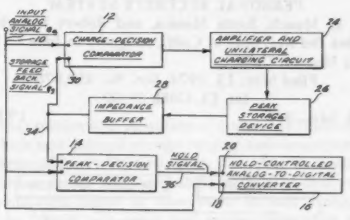


the computer means including means for combining the remainder signal with a signal which is a function of the gain adjustment of the error signal and the least significant bit in the converters to provide a first combined signal, means for combining the first combined signal with the digital signal from the analog to digital converter to provide a second combined signal, and the integrator integrating the second combined signal.

3,882,489
APPARATUS FOR PRODUCING A DIGITAL ELECTRICAL REPRESENTATION OF A PEAK VALUE OF AN ANALOG SIGNAL

Bernd R. Guggolz, Collings Lake, N.J., assignor to John Chatillon & Sons Inc., Kew Gardens, N.Y.

Filed May 15, 1974, Ser. No. 470,029
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 **7 Claims**



1. Apparatus for producing and maintaining a digital electrical representation of substantially a peak value of an analog signal, comprising:

A/D converter means responsive to an input analog signal to produce an electrical digital number representation of the value of said analog signal, said A/D converter means having a control terminal which when supplied with a first value of a control signal permits said digital number representation to follow both increases and decreases in said analog signal value, and which when supplied with a second value of said control signal prevents said electrical digital representation from following reductions in said analog signal value from said peak value;

electrical peak-detector and storage means supplied with said analog signal for producing and storing a signal substantially equal to said peak value of said analog signal;

comparator means for comparing said stored signal with said analog signal and for producing a control signal of said second value when the value of said stored signal exceeds the value of said analog signal by at least a predetermined amount and for producing a control signal of said first value at other times; and

means for applying said control signal to said control terminal of said A/D converter means to hold constant said digital number representation while said second value of said control signal persists.

3,882,490

INDICATING DEVICE

Hiroyuki Tashiro, and Susumu Urano, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed July 30, 1973, Ser. No. 383,547

Claims priority, application Japan, Aug. 11, 1972, 47-95031

Int. Cl. G08b *5/00*

U.S. Cl. 340—366 B **3 Claims**

1. An indicating device comprising a liquid crystal element in plate form disposed in the front part of the device and having a light transmission factor which changes considerably with variation of a voltage applied thereto, a detecting switch having an on-off operation for detecting variation of a quantity or condition to be detected and connected electrically to said liquid crystal element, a light emitting diode disposed at the rear of said liquid crystal element, and a reflecting plate for reflecting an incident light passing through said liquid crystal element and disposed behind said liquid crystal whereby when the light transmission factor of said liquid crystal element is caused to increase with reduction of a voltage applied across said liquid crystal, indication of a warning or the like is given by the light emitted from said light emitting diode and passing through said liquid crystal.

3,882,491

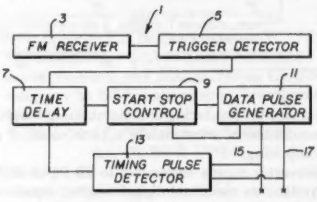
PERSONAL SECURITY SYSTEM

Robert E. Mauch, Santa Monica, and Robert I. Sarbacher, Marina Del Rey, both of Calif., assignors to John C. Bogue, Santa Monica, Calif.

Filed Mar. 13, 1974, Ser. No. 450,878

Int. Cl. G08b *29/00*

U.S. Cl. 340—409 **19 Claims**



1. A distress signal relay system comprising: a plurality of remote units and a master unit coupled to said remote units, said plurality of remote units each including receiving means to receive a radio frequency distress signal and providing an output signal having a time duration greater than a given time duration in response to the receipt of said distress signal, and means responsive to said output signal of said greater duration for generating output data pulses during a given time slot determined by timing pulses received from said master unit by each of said plurality of remote units and said master unit including means to process data pulses from each remote unit, a plurality of lamps at least equal in number to the number of said plurality of remote units, a different one of said plurality of lamps being associated with each of said plurality of remote units, and means coupled between said means to process said data pulses and said lamps for energizing only those lamps for which the corresponding remote unit has received a distress signal.

3,882,492

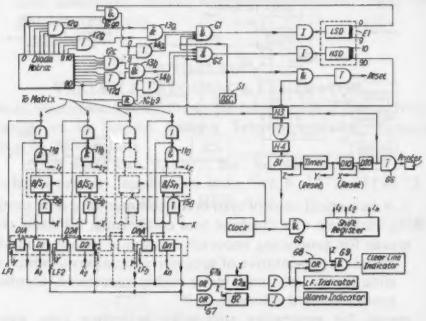
DATA SIGNALLING SYSTEMS

David J. McSorley, Twickenham, and Jaye De Croos, Banstead, both of England, assignors to Alarm Equipment Supplies Limited, Twickenham, Middlesex, England

Filed Apr. 17, 1973, Ser. No. 351,882

Int. Cl. G08b *19/00*; **H04g** *3/00*

U.S. Cl. 340—413 **7 Claims**



1. A receiver for use in a security alarm signalling system in which a predetermined number of remote stations are each connected to a central receiving station by respective pairs of wires, each remote station being identified by a different predetermined number, and the receiver including a multiple input encoder, each input of said encoder being connected, when in use, to a respective pair of wires from one of the numbered remote stations, and the receiver also including a multiple input binary store; gating means connected between the outputs of said binary store and corresponding inputs of said encoder; scanning means for periodically scanning the inputs of said encoder, said scanning means including enabling means for periodically enabling each of said gating means in turn; said encoder including means responsive to a change in the signal level on any one of its inputs for generating a coded output signal representative of the number of the remote station to which the input is connected, and a digital display device including means for converting the coded output into a digital read-out of said number; and means responsive to the presence of a signal in said encoder for inhibiting the enabling means until the signal has been encoded and read out on the display device.

3,882,493

DOPPLER CORRELATION RADAR EXHIBITING REDUCED TIME SIDE LOBES

Thomas Vincent Bolger, Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

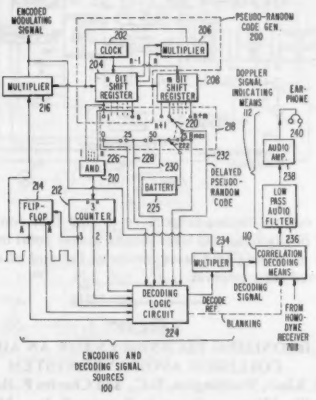
Filed June 11, 1973, Ser. No. 368,660

Int. Cl. G01s *9/42*; **G08b** *13/22*

U.S. Cl. 343—5 PD **7 Claims**

1. In a moving target correlation radar system of the type comprising means for transmitting a continuous carrier wave modulated with a predetermined encoded modulating signal including a pseudo-random code sequence, means for demodulating echo signals received from any moving target within a given range illuminated with said transmitted signal, range

bins switch means for selectively deriving a delayed pseudo-random code sequence having a delay corresponding to any one of a plurality of different range bins, means coupled to said range bins switch means for generating a decoding signal including a pseudo-random code sequence manifesting the delay selected by said range-bins switch means, and doppler frequency means including correlation decoding means for correlating said demodulated echo signals against said decoding signal to derive an output signal from said correlation decoding means which includes the doppler-frequency signature signal of a moving target having a range within the range bin selected by said range bins switch means; the improvement wherein:



both said transmitting means and said decoding signal generating means are respectively arranged to provide respective encoded modulating and decoding signals which result in the output from said correlation decoding means including both a relatively high frequency carrier component modulated by the time side lobes corresponding to the doppler-frequency signature signals of all received moving targets having a range outside of the selected range bin and a base-band component corresponding to the doppler frequency signature signal of only a received moving target having a range within the selected range bin, and

said doppler-frequency means further includes doppler-frequency indicating means responsive only to the base-band component of the output from said correlation decoding means of a moving target.

3,882,494

DOPPLER CORRELATION RADAR PROVIDING COMBINED TARGET DETECTION AND RANGING

Thomas Vincent Bolger, Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 11, 1973, Ser. No. 368,661

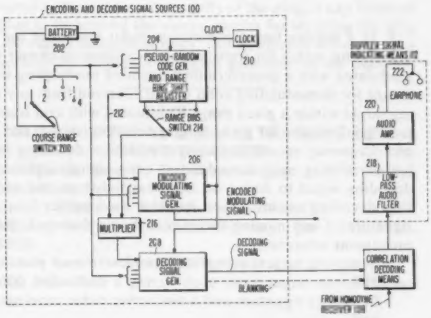
Int. Cl. G01s 9/42; G08b 13/22

U.S. Cl. 343—5 PD **6 Claims**

1. In a moving target correlation radar system of the type comprising means for transmitting a continuous carrier wave modulated with a predetermined encoded modulating signal including a pseudo-random code sequence, means for demodulating echo signals received from any moving target within a given range illuminated with said transmitted signal, range-bins switch means for selectively deriving a delayed pseudo-random code sequence having a delay corresponding to any one of a plurality of different range bins, means coupled to said range-bins switch for generating a decoding signal including a pseudo-random code sequence manifesting the delay selected by said range-bins switch, and doppler-frequency means including correlation decoding means for correlating said demodulated echo signals against said decoding signal to derive an output signal from said correlation decoding means which includes the doppler-frequency signature signal of a moving target having a range within the range bin selected by said range bins switch means; the improvement wherein:

said transmitting means is arranged to provide a cyclic encoded modulating signal, each cycle of said encoded modulating signal including at least one detection portion and one range bins portion which occur serially with respect to each other, said pseudo-random code sequence occurring only during said range-bins portion, said encoded modulating signal having a first format during a detection portion thereof, and

said decoding signal generating means is arranged to provide a cyclic decoding signal, each cycle of said decoding signal including at least one detection portion and one range-bins portion which occur serially with respect to each other in predetermined phase relationship with respect to said detection portion and range-bins portion of said encoded modulating signal, said delayed pseudo-random sequence only occurring during said range-bins portion of said decoding signal, and said predetermined



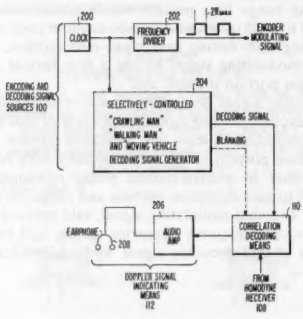
phase relationship providing a cooperative relationship in which said delayed pseudo-random code sequence has an appreciable correlation with the pseudo-random sequence during said range-bins portion of said encoded modulating signal as manifested in said demodulated echo signals only when said moving target has a range within the range bin selected by said range-bins switch, said detection portion of said decoding signal having a second format cooperatively related to said first format of said detection portion of said encoded modulating signal so that with said predetermined phase relationship there is provided a partial but significant amount of correlation during said detection portion of said decoding signal when said moving target has a range within any of said plurality of different range bins,

whereby the output from said correlation decoding means includes a relatively-low amplitude doppler-frequency signature signal of a moving target having a range within a given one of the range bins when said given one of said range bins is not selected by said range-bins switch and includes a relatively high-amplitude doppler-frequency signature signal of that moving target when said given one of said range bins is selected by said range-bins switch.

3,882,495
DOPPLER CORRELATION RADAR PROVIDING COARSE-RANGE DETECTION RESOLUTION

Thomas Vincent Bolger, Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 11, 1973, Ser. No. 368,869
Int. Cl. G01s 9/42; G08b 13/22
U.S. Cl. 343—5 PD **9 Claims**



1. In a moving target correlation radar system of the type comprising means for transmitting a continuous carrier wave modulated with a predetermined encoded modulating signal, means for demodulating echo signals received from any moving target within a given range illuminated with said transmitted signal, means for generating a decoding signal, and doppler-frequency means including correlation decoding means for correlating said demodulated echo signals against said decoding signal to derive an output signal from said correlation decoding means which includes the doppler-frequency signature of any moving target then being detected; the improvement wherein:

said moving targets comprise a predetermined plurality of different target types each having a distinctive doppler-frequency signature and a distinctive radar cross-section, and

said decoding signal generating means includes means for applying to said correlation decoding means at least a selected one of a group of different predetermined decoding signals each of which has a format corresponding to a different target type, each of said respective formats of said different decoding signals only correlating with said demodulated echo signal over a different range subinterval of said given range with the range subinterval corresponding to a target type of relatively smaller radar cross-section being closer than the range subinterval corresponding to a target type of relatively larger radar cross section.

3,882,496
NON-DESTRUCTIVE WEAPON SYSTEM EVALUATION APPARATUS AND METHOD FOR USING SAME

Virgil D. Lewis, Silver Spring, and Gregory V. Cirincione, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1974, Ser. No. 453,477
Int. Cl. F41g 3/36; G01s 9/02
U.S. Cl. 343—6 R **10 Claims**

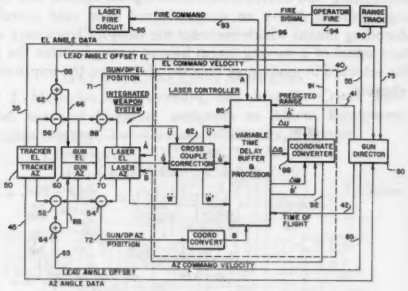
1. Apparatus for nondestructively evaluating the performance of a weapon system, which comprises:

weapon means for launching a projectile intended to intercept a moving target;

tracking means for obtaining position and range data of said target;

first control means responsive to said data for computing the lead angle and predicted range of said target to define a point in space where said projectile, if then launched, will intercept said target;

laser means for illuminating said point in space with a laser beam; and

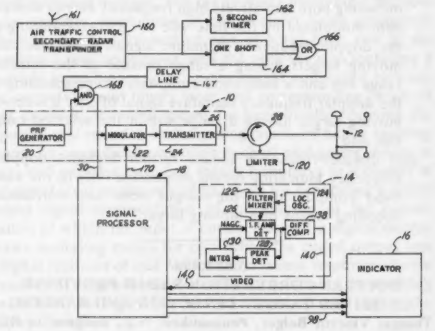


laser control means responsive to said first control means for positioning said laser means at said point in space and for activating said laser means at the end of a predetermined time interval.

3,882,497
SYNCHRONIZING TECHNIQUES FOR AN AIRCRAFT COLLISION AVOIDANCE SYSTEM

Philip J. Klass, Washington, D.C., and Charles P. Harman, Jr., Roseville, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed July 2, 1973, Ser. No. 375,631
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 LC **6 Claims**



5. In a system for avoiding collision between a group of aircraft within range of a ground-controlled beam of electromagnetic radiation that is cyclically moved through a predetermined arc so that the beam periodically strikes the aircraft, improved apparatus carried on one of the aircraft in the group and adapted to cooperate with like apparatus carried on other aircraft in the group comprising in combination:

means for generating a start signal in response to the receipt of the beam;

means for transmitting an interrogating signal to the other aircraft in response to the start signal, for receiving response signals transmitted by the other aircraft in response to the interrogating signal and for transmitting a response signal in response to the receipt of each interrogating signal transmitted by the other aircraft;

delay means for delaying the transmitting of the interrogating signal to the other aircraft for an adjustable time period; and

means for processing information derived from the interrogating signal and the response signals received from the other aircraft to determine the relative positions of the one aircraft and the other aircraft.

3,882,498

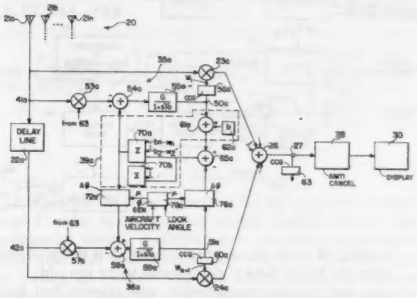
ADAPTIVE ARRAY PROCESSOR PROVIDING IMPROVED MAINLOBE MAINTENANCE

August L. McGuffin, Clinton, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Feb. 22, 1973, Ser. No. 334,519

Int. Cl. G01s *9/42*

U.S. Cl. 343—7 A **1 Claim**



1. An adaptive AMTI processor for receive-mode operation with an array antenna, comprising, in combination:

a plurality of element circuits connected, one each, to the respective antenna elements, each said circuit including a delay line arranged to receive the output from the antenna element, a pair of cross-correlator control loops connected respectively to the input and output of said delay line, weighting feedback means connected to said cross-correlator control loops and incorporating beamforming circuit means operable to control the gain of said cross-correlator control loops to suppress signal returns incident upon said antenna from all directions other than the angle of a narrow arc centered about the antenna boresight, and phase shift means also incorporated in said weighting feedback means for introducing into the feedback signal path a phase shift approximately 180° greater than the phase difference between corresponding clutter return signals appearing at the input and output of said delay line;

an AMTI canceller circuit; and

summing circuit means for combining all outputs from said cross-correlator control loops and passing the resultant signal to said AMTI canceller circuit for processing.

3,882,499

ANTENNA LEAD-THROUGH ASSEMBLY FOR A RADIO BUOY

Humbert Garito, Marseille, France, assignor to Le Nickel, Marseille; Centre National Pour l'Exploitation des Oceans, Paris and ERJI, Paris, France

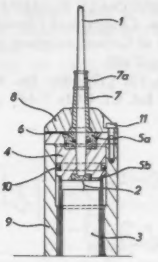
Filed Oct. 23, 1973, Ser. No. 408,520

Claims priority, application France, Oct. 25, 1972, 72.37747

Int. Cl. H01q *1/34*

U.S. Cl. 343—709 **5 Claims**

1. An antenna lead-through assembly for a submersible radio buoy having a tubular body, the assembly comprising a plug fitted in the tubular body of the buoy, the plug having a tapered axial bore widening outwardly to receive the inner end part of the antenna tapered to a complementary shape and the plug having two generally cylindrical recesses formed one at the inner end and the other at the outer end thereof, a first toroidal seal interposed between the body and the plug, a second toroidal seal fitted around the antenna and residing in the outer cylindrical recess, a filling of hardenable synthetic



resin in the inner cylindrical recess, and a filling of hardenable synthetic resin in the outer cylindrical recess so as to cooperate with said recess and said second toroidal seal, a sleeve surrounding the antenna outwardly of the plug, a cap fitted on the plug to lie around the sleeve, means for securing the plug and the cap to the tubular body, and an electric conductor for connecting the antenna to a signal generator of the buoy.

3,882,500

SYSTEM FOR THE AUTOMATIC TRACKING OF A MOVING TARGET

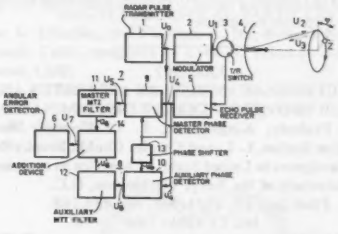
Harald Sikora, Bremen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,532

Claims priority, application Germany, Nov. 11, 1972, 2255373

Int. Cl. G01s *9/02*

U.S. Cl. 343—7.4 **3 Claims**



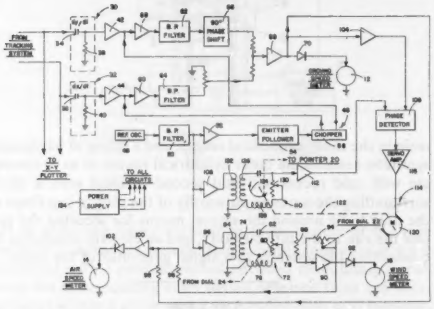
1. A radar system for tracking a moving target comprising means for transmitting pulse-modulated electromagnetic energy in a rotating beam whose axis describes a cone, means for receiving electromagnetic energy reflected by a moving target, a first phase detector connected to the receiving means and supplied by a first reference signal from the transmitting means to compare the phase of the reflected signal with the transmitted signal, first frequency selecting means connected to the first phase detector to pass-through the real signals whose frequency differs due to Doppler shifting from that of the transmitted electromagnetic energy, a second phase detector connected to the receiving means and supplied by a second reference signal which is phase shifted about 90° with respect to the first reference signal, second frequency selecting means connected to the second phase detector to pass-through the imaginary Doppler signal components, vector adding means

connected to the first and second filter means for adding the real and imaginary Doppler signal components, and tracking error detecting means connected to the output of the said adding means.

3,882,501
SYSTEM FOR DETERMINING SPEED AND HEADING OF AIRBORNE EQUIPMENT WITH RECTILINEAR COORDINATE POSITIONS

Richard Allen Botzum, Chania, and Charalampos Koufidakis, Canea, Crete, both of Greece, assignors to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 11, 1974, Ser. No. 441,144
Int. Cl. G01s *9/44*
U.S. Cl. 343—9 **24 Claims**



9. The system for tracking airborne equipment of claim 7 further characterized in that said ground speed determination circuit comprises:

a. rate of change means for determining the rates of change of said first and second coordinate signals with respect to time,

b. summing means operatively connected to said rate of change means for summing the rates of change of the first and second coordinate signals, and

c. ground speed indicative means operatively connected to said summing means and being responsive to the amplitude of the summed signal to thereby determine the speed of the airborne equipment.

3,882,502
CRT MULTIPLE-SCAN DISPLAY APPARATUS AND METHOD PROVIDING TARGET DISCRIMINATION

Roger H. Peabody, Kings Park, L. I.; Seymour Sutkin, Huntington Station, L. I., and Charles Chubb, Brookville, all of N.Y., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1974, Ser. No. 434,168
Int. Cl. G01s *7/06*
U.S. Cl. 343—17 **7 Claims**

1. A multiple-scan radar display functioning to display a past history of the target's position along with the target's present position in such a manner as to highlight the presence of moving targets amid stationary targets and noise by repetitively displaying data from a finite number of past radar antenna scans in rapid succession comprising:

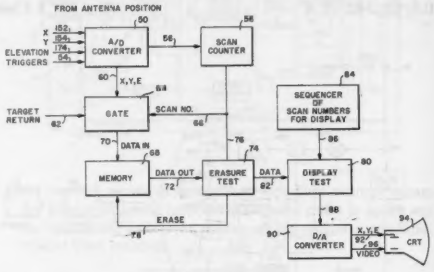
means to receive antenna beam-position data and convert said data to its proper form wherein said antenna beam position data consists of X-coordinate, Y-coordinate, and elevation data;

a scan counter receiving its input signal from said means to receive antenna position data each time the antenna starts a new scan, the input signal changing the count held in said scan counter;

gate and timing means to receive an input signal each time a target signal is detected, said gate and timing means also being connected to said means to receive antenna beam position data and to said scan counter, said gate-and-timing means sampling the X-coordinate, Y-coordinate, and elevation data therefrom and sampling the scan count in said scan counter upon the receiption of a target return signal;

a memory, connected to said gate and timing means, into which is read the sampled data and the scan count at the proper time by the gate and timing means;

erasure test means receiving inputs from said memory and said scan counter and acting to compare the scan count of the oldest target data stored in said memory to the present scan count in said scan counter to determine whether this target data is from a scan older than the scans that are to be displayed, said erasure test means



sending an erase signal to said memory if the scan count from the target data is determined to be too old;

display test means connected to said erasure test means connected to said erasure test means to receive the target data from said erasure test means if it is not too old and to compare the scan count of this target data to a scan number indicating the scan to be displayed at a particular time;

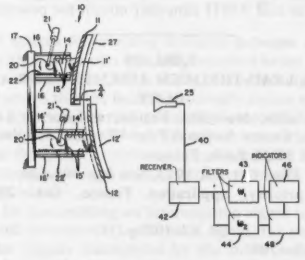
D/A converter means connected to said display test means and acting to receive a signal from said display test means if the scan number and the scan count of the target data are equal and to convert the X-coordinate, Y-coordinate, and elevation data into analog form; and

a display device connected to said D/A converter means and utilizing this analog target data to display the targets in their proper sequence and position.

3,882,503
WAVE DETECTION APPARATUS

Norbert J. Gamara, Los Altos, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Aug. 17, 1960, Ser. No. 50,262
Int. Cl. G01s *1/00*
U.S. Cl. 343—100 R **5 Claims**



5. Wave detection apparatus comprising an antenna having at least two relatively movable wave reflecting surfaces

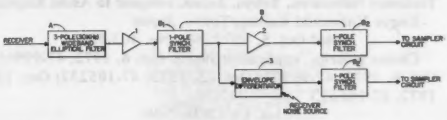
adapted to reflect electromagnetic waves received from the same direction, said surfaces being spaced from each other along said direction by one-quarter of a wavelength at the operating frequency of the antenna, means to reciprocate said surfaces at relatively different rates, and means for receiving waves reflected from said surfaces and for discriminating between waves modulated at said different rates.

3,882,504

PROCESS OF AND APPARATUS FOR PROVIDING FILTER DISCRIMINATION BETWEEN RECEIVED DIRECT IMPULSES AND DELAYED PULSES AS IN PULSE NAVIGATION AND RELATED APPLICATIONS

John M Currie, Westford, and Herbert L. Brown, Cohasset, both of Mass., assignors to International Navigation Corporation, Bedford, Mass.

Filed Nov. 2, 1973, Ser. No. 412,249
Int. Cl. G01s *1/24*
U.S. Cl. 343—103 **13 Claims**



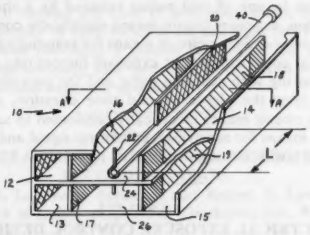
12. A composite filter apparatus for signal discrimination in Loran C pulse navigation and related radio-frequency signal applications, having, in combination, means for receiving said signal, and filter means connected with said receiving means and having an overall response characteristic substantially symmetrically disposed with respect to the signal center frequency that drops gradually in bell-shaped fashion over a limited predetermined frequency band, then steeply drops with substantially infinite slope and then more gradually flares out with high attenuation for more remote frequencies.

3,882,505

DUAL BAND PHASED ARRAY ELEMENT

Robert J. Mailloux, 98 Concord Rd., Wayland, Mass. 01778

Filed May 30, 1974, Ser. No. 474,561
Int. Cl. H01q *13/06, 21/00*
U.S. Cl. 343—727 **10 Claims**



1. A dual band phased array element comprising in combination

means for forming a plurality of first waveguide sections, said plurality of first waveguide sections having a central wall divider, said plurality of first waveguide sections being dielectrically loaded,

means for forming a plurality of second waveguide sections, said plurality of second waveguide sections being located within said plurality of first waveguide sections, said plurality of second waveguide sections being located at one end of said plurality of first waveguide sections, and a low frequency coaxial line contained within said plurality of first waveguide sections and extending into said plurality of second waveguide sections, said low frequency coaxial line supplying the input signal to said plurality of second waveguide sections.

3,882,506

ANTENNA FOR DIRECTION FINDERS WITH MAST ISOLATION

Kenzo Mori; Yujiro Katsube, both of Tokyo, and Norio Ikeda, Ichikawa, all of Japan, assignors to Taiyo Musen Co. Ltd., Tokyo, Japan

Filed Feb. 20, 1974, Ser. No. 443,949
Int. Cl. H01q *21/00*
U.S. Cl. 343—728 **1 Claim**

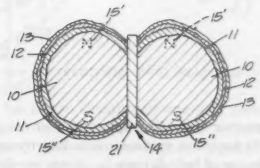
1. An antenna device for direction finders comprising a loop means formed of two loop antennas arranged so as to rectangularly intersect with each other and shields fitted respectively with said antennas, a sense determining vertical antenna provided at the center of said loop means, a hollow insulated base fitted with said loop means at the lower end and a transformer provided within said base so as to take a sense determining output out of its secondary side, the primary winding in said transformer being connected on both sides respectively with the lower central point of said loop means and the lower side of said vertical antenna, all the above mentioned composing members being not earthed.

3,882,507

MEANS AND METHOD FOR CREATING A VISIBLE DISPLAY UTILIZING HIGH SENSITIVITY MAGNETOCHEMICAL PARTICLES

Lyne S. Trimble, and Florence A. Ito, both of North Hollywood, Calif., assignors to Lyne S. Trimble, North Hollywood, Calif.

Filed Dec. 20, 1971, Ser. No. 210,077
Int. Cl. G01d *15/34*; G03g *19/00*
U.S. Cl. 346—74.1 **46 Claims**

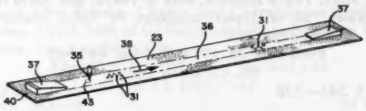


1. A high sensitivity magnetochemical particle, comprising: two anisotropic masses of magnetic material; non-magnetic bond means interconnecting surface portions of said masses with their maximum anisotropic axes parallel, said masses when subjected to a magnetic field, being capable of generating bond breaking forces between adjacent-like magnetic poles induced in the masses parallel to the bonded surface portions thereof by said magnetic field.

3,882,508
STIMULATION APPARATUS FOR A JET DROP RECORDER

Leonard G. Stoneburner, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed July 22, 1974, Ser. No. 491,154
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 **18 Claims**

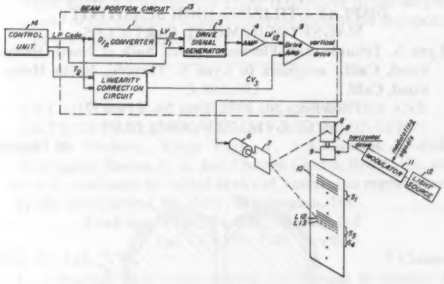


1. In a jet drop recording head comprising an orifice plate provided with a plurality of orifices arranged along a line, a common manifold connecting with said orifices, means marginally securing said orifice plate to said manifold for definition of an acoustical wave guide, means for supplying a recording liquid to said manifold at sufficient pressure for forcing the liquid through said orifices and creating a line of liquid jets, means for causing a series of bending waves to travel lengthwise along said orifice plate and stimulate said jets to break up into streams of regularly formed drops, and means for charging and deflecting said drops to create intelligible patterns therefrom; the improvement wherein the marginal attachment of said orifice plate to said manifold defines a wave guide of progressively decreasing width to counteract the naturally occurring attenuation of said waves.

3,882,509
LINEARITY CORRECTION CIRCUIT FOR AN OPTICAL SCANNING DEVICE

John E. Newton, and Robert L. Reifsteck, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,350
Int. Cl. B41b *13/00*
U.S. Cl. 354—5 **3 Claims**



1. In a character recording apparatus for recording characters on a light sensitive medium including means for forming at least one beam of light for use in character recording, a first mirror for scanning said beam in a first direction to form at least portions of characters generally arranged in a line and a second mirror movable in a second direction relative to said first direction to positions respectively corresponding to lines of a page, said first direction being along such lines and said second direction being between topmost and bottom-most ones of such lines of the page, and first and second galvanometers coupled to such first and second mirrors and responsive to first and second drive signals for respectively scanning and positioning said first and second mirrors, apparatus for producing such second drive signal comprising:

a. means for producing a code signal having an information content representative of the position of a line of a page on which characters are to be formed;

b. linear signal producing means responsive to said code signal for producing a linear output signal corresponding to such line;

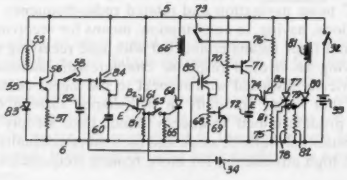
c. linearity correction circuit means responsive to such code signal for producing a correction signal which is a function of the position of such line on the page; and

d. means responsive to said linear output signal and said linearity correction signal for producing such second drive signal and providing it as an input to said second galvanometer whereby said second galvanometer is moved to a position corresponding to such line on the page.

3,882,510
OSCILLATION SYSTEMS FOR CONTROL OF CAMERA SHUTTERS

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1973, Ser. No. 403,829
Claims priority, application Japan, Oct. 6, 1972, 47-99901; Oct. 6, 1972, 47-99902; Oct. 23, 1972, 47-105232; Oct. 23, 1972, 47-105233
Int. Cl. G03b *7/08*
U.S. Cl. 354—24 **27 Claims**



1. In a camera having an electronically controlled shutter, oscillation means for providing a series of pulse signals whose frequency is a function of light intensity at an object to be photographed, shutter-opening circuit means electrically connected with said oscillation means for opening the shutter in response to one of said pulses selected by a shutter-release operation, exposure circuit means electrically connected with said shutter-opening circuit means for responding to said one pulse for converting preset exposure factors into a time duration starting with said one pulse and for providing a control signal after the elapse of said time duration, and shutter-closing circuit means electrically connected to said exposure circuit means for receiving said control signal and in cooperation therewith closing the shutter.

3,882,511
ELECTRICAL EXPOSURE CONTROL DEVICE FOR A PHOTOGRAPHIC CAMERA

Kayoshi Tsujimoto, and Toru Matsui, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1973, Ser. No. 386,557
Claims priority, application Japan, Aug. 8, 1972, 47-78791
Int. Cl. G03b *7/08*
U.S. Cl. 354—29 **9 Claims**

1. An electrical exposure control device for use in a photographic camera, comprising:

a light receiving circuit including at least one light receiving element for generating a photometric output in accordance with the luminance on the light receptive surface thereof;

objective lens diaphragm adjusting means for setting the camera lens aperture;

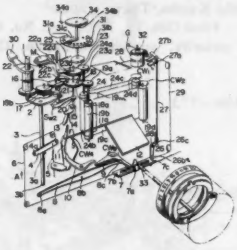
a selecting member for selecting a first and a second exposure control, said first exposure control setting the camera shutter speed and adjusting said diaphragm means commensurate with said shutter speed setting and said photometric output, said second exposure control adjusting shutter speed and said diaphragm means in programmed relation commensurate with said photometric output;

a first variable resistor whose resistance varies in accordance with said selected shutter speed with said selecting member selecting said first exposure control;

a movable member responsive to said photometric output;

a detecting member for detecting the position of said movable member;

a diaphragm operating member responsive to said detecting member for controlling said objective lens diaphragm means;



a second variable resistor whose resistance is varied by said detecting member in accordance with the detected position of said movable member;

a timing circuit having a variable time constant for controlling the shutter speed, said time constant varying in accordance with said first variable resistor and said second variable resistor with said selecting member respectively selecting said first and said second exposure control;

means for switching said first variable resistor and said second variable resistor into said timing circuit in dependence upon the selection of said first and second exposure controls; and

means for varying the ratio of said photometric output to the quantity of light incident on said light receiving element and providing a greater ratio with said selecting member selecting said first exposure control than with said second exposure control.

3,882,512

CAMERA SYSTEM WITH ON-FRAME DIGITAL RECORDING MEANS

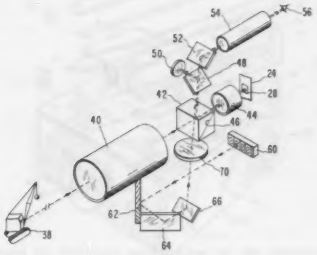
Franklin B. Lawrence, Saratoga, and Robert E. Lewis, Palo Alto, both of Calif., assignors to Timelapse, Inc., Mountain View, Calif.

Filed June 25, 1973, Ser. No. 373,043

Int. Cl. G03b *17/24*

U.S. Cl. 354—109 **6 Claims**

1. A camera system comprising: a single lens reflex camera having an optical axis, an actuatable shutter mechanism, a film plane intersecting the optical axis, a first lens operable to focus light rays to substantially a standard infinity focus, an optical device having a partially reflective face between the first lens and the film plane, said face being transmissive to the light rays from said first lens, a second lens between said optical device and said film plane, and means for receiving a film having a plurality of image frames thereon and for placing the film at said film plane to permit the image frames to move successively into optical alignment with said optical axis, whereby light rays representing the image of an external object can be directed into the camera through said first lens, said optical device and said second lens and onto an image frame aligned therewith; an electronic digital clock circuit; an actuatable visual display device, said circuit being coupled



with said shutter mechanism and said display device for simultaneously actuating the same; and means optically coupled to said optical device for directing an image of said display onto said face for reflection toward an image frame aligned with said lens assembly.

3,882,513

EQUIPMENT FOR RECORDING RELIEF OR STEREOSCOPIC IMAGES

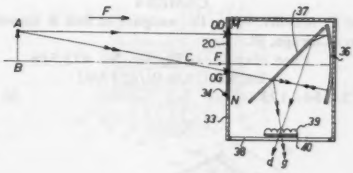
Maurice Bonnet, Puteaux, France, assignor to Agence Nationale de Valorisation de la Recherche ANVAR, Neuilly-sur-Seine, France

Filed Aug. 2, 1973, Ser. No. 384,960

Claims priority, application France, Aug. 18, 1972, 72.29581

Int. Cl. G03b *35/08*

U.S. Cl. 354—115 **3 Claims**



1. In a device for recording relief images of remote objects, the combination of:

a housing having an opening in one wall thereof;

a convergent optical system disposed within said housing and aligned with said opening, said optical system being spaced from said opening by an amount substantially equal to the principal focus of such optical system, and said optical system comprising a concave mirror facing said opening and a semitransparent mirror disposed between said concave mirror and said opening and inclined at a 45° angle;

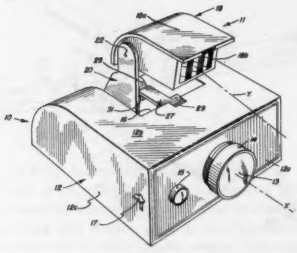
a sensitive film disposed in said housing and lenticular means comprising at least one optical element overlying said film and having a surface composed of cylindrical lenticular elements, and sensitive film and overlying optical element being positioned to receive an image from said optical system.

3,882,514

CAMERA WITH A SELF-CONTAINED LIGHT SYSTEM

Thomas G. Graham, Point Pleasant Beach, N.J., assignor to Berkey Photo, Inc., Paramus, N.J.

Filed Feb. 4, 1974, Ser. No. 439,306
Int. Cl. G03b 15/03
U.S. Cl. 354—149 6 Claims



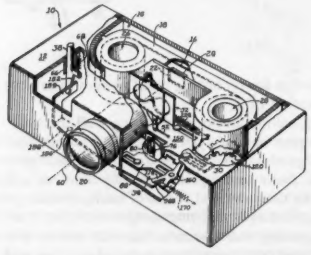
1. A camera comprising a housing, a lens mounted on one wall of the housing and having a fixed optical axis, focusing means operatively connected to said lens and adjustably mounted on said housing for varying the focal length of said lens, and a self-contained light system mounted on a second wall of said housing for movement between an extended operative position and a retracted inoperative position; said light system including a reflector piece having a light source disposed therein whereby said light source and reflector piece are movable only as a unit between extended and retracted positions; mounting means interconnecting said reflector piece and said housing; and actuating means carried on said housing and being responsive to the adjustment of said focusing means to effect tilting of said reflector piece and light source relative to the lens optical axis, only when said light system is disposed in said extended operative position.

3,882,515

SHUTTER SETTING AND FILM ADVANCING MECHANISM FOR AN ELECTRICALLY OPERATED CAMERA

Arthur C. Mueller, Niles, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 28, 1974, Ser. No. 473,528
Int. Cl. G03b 9/14, 17/42
U.S. Cl. 354—173 30 Claims



1. For a photographic camera having a film transport mechanism and an exposure controlling mechanism including a shutter, the improvement in a drive control system comprising:

drive motor means;

power supply means for energizing said motor means;

circuit means coupled to said power supply means for selectively energizing said motor means;

drive plate means cyclically drivable by said motor means;

film transport means operatively coupled to said drive plate means for actuation during part of the operative cycle of said drive plate means;

shutter setting drive means operatively coupled to said drive plate means for action during another part of the cycle of said drive plate means;

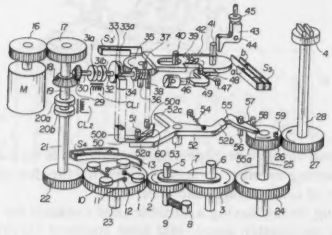
said film transport means and said shutter setting drive means being actuated independently during the parts of said cycle whereby said motor means drives only one of said means at a time.

3,882,516

AUTOMATIC WIND-UP DEVICE TO DETECT COMPLETION OF FILM WIND-UP

Mitsutoshi Ogiso, Kawasaki; Hiroshi Aizawa, Machida, and Tomonori Iwashita, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1973, Ser. No. 407,874
Claims priority, application Japan, Oct. 24, 1972, 47-106570
Int. Cl. G03b 1/12
U.S. Cl. 354—173 6 Claims



1. An automatic wind-up device for detecting completion of film wind-up in a camera, comprising:

means for winding up film to a condition of completion;

means for driving said wind-up means at controlled speeds;

transmission means for coupling force supplied by said driving means to said film wind-up means;

means for controlling said driving means;

means for sensing the speed of said driving means for rendering said driving control means inactive, said control means being rendered inactive upon the sensing of a speed resulting from completion of wind-up action; and

means responsive to the completion of wind-up action for releasing said transmission from supplying driving force to said wind-up means until said driving control means becomes inactive for preventing excessive load on said film wind-up means.

3,882,517

SYSTEM FOR MOUNTING PHOTOGRAPHIC ACCESSORIES ON A CAMERA

Edwin H. Land, and John B. Morse, both of Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 300,820, Oct. 25, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,980
Int. Cl. G03b 11/00, 17/00
U.S. Cl. 354—295 1 Claim

1. A detachable holder for receiving and supporting a flash unit on a camera of the type including a flash unit socket and electrical means including a pair of contacts within the socket for converting the camera from a daylight mode of operation to a flash mode of operation in response to the pair of electri-

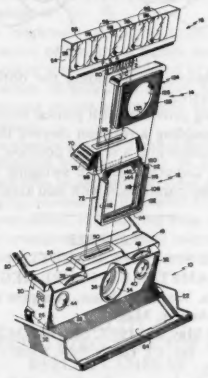
cal contacts being electrically connected, said detachable holder comprising:

a support member;

means for coupling said support member to the camera flash unit socket;

a flash unit socket on said support member for receiving and supporting a flash unit thereon;

electrical means on said support member for electrically connecting the pair of electrical contacts in the camera flash unit socket to convert the camera from the daylight mode to the flash mode of operation upon operatively



coupling said support member to the camera flash unit socket and operatively coupling a flash unit to said flash unit socket on said support member, said electrical means being inoperative for electrically connecting the pair of electrical contacts in the camera flash unit socket when said support member is operatively coupled to the camera flash unit socket and a flash unit is not operatively coupled to said flash unit socket on said support member; and means on said support member for receiving and holding at least one accessory, other than a flash unit, for modifying the performance of the camera.

3,882,518

PROCESSING SYSTEM FOR PHOTOGRAPHIC APPARATUS

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

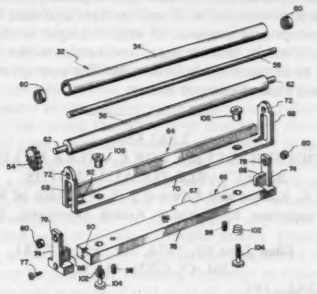
Filed Mar. 6, 1974, Ser. No. 448,448

Int. Cl. G03d *9/00*

U.S. Cl. 354—301 **19 Claims**

1. Photographic apparatus, including means for spreading a processing fluid between a pair of sheet materials comprising: a pair of elongated spreader elements;

means for mounting said spreader elements in juxtaposition, said mounting means being structured to facilitate the displacement of said spreader elements away from each other, and wherein said mounting means include a pair of support members each of which includes means for rotatably mounting at least one of said spreader elements therebetween and means for linearly guiding the movement of said spreader elements relative to each other; and manually operable means for adjusting the spacing between said spreader elements, said manually operable means cooperatively acting with said linearly guiding



means to facilitate adjustment of the spacing between said spreader elements.

3,882,519

PHOTOGRAPHIC APPARATUS FOR USE WITH PERCUSSIVELY IGNITABLE AND ELECTRONIC FLASH UNITS

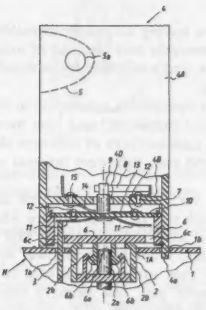
Alfred Winkler, Munich, and Dieter Engelsmann, Unterhaching, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 22, 1973, Ser. No. 390,561

Claims priority, application Germany, Sept. 7, 1972, 2243832

Int. Cl. G03b *15/05*

U.S. Cl. 354—141 **3 Claims**



1. The combination of a photographic apparatus having a housing provided with an aperture, a socket for multiple flash lamp holders indexible in said housing between a plurality of predetermined positions and an impeller which is movable from a first to a second position to extend outwardly through said aperture at least in said second position thereof and to thereby initiate the firing of a flash lamp in a holder which is connected with said socket, with an electronic flash unit having a casing including a foot directly but separably connectable to and indexible with said socket, said casing having an opening in register with said aperture to permit entry of said impeller into said casing at least in said second position of said impeller when said foot is connected with said socket, said flash unit further comprising normally open switch means provided in said casing and including first contact means and a plurality of second contact means, one for each position of said socket, said second contact means being indexible with and movable relative to said foot so that a different second contact means is located behind said opening in each position

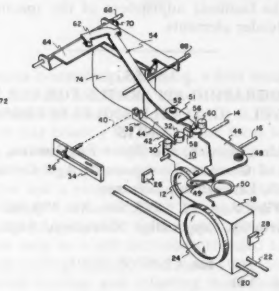
of said socket, said impeller being arranged to move the second contact means behind said opening into engagement with said first contact means not later than upon completion of movement from said first to said second position thereof when said foot is connected with said socket, and said flash unit further comprising a source of artificial light in circuit with said switch means and arranged to illuminate the subject in response to engagement between said first contact means and one of said second contact means.

3,882,520

FOCUSING DEVICE FOR CAMERA HAVING SELECTABLE FOCAL LENGTHS

Leonard F. Kamp, and Edward J. Koval, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 10, 1974, Ser. No. 477,581
Int. Cl. G03b *13/18*
U.S. Cl. 354—197 **6 Claims**



1. In a camera having an axially movable primary lens, a converter lens movable into and out of axial alignment with said primary lens, and a movable focus member; the improvement comprising:

a cam member operatively connected to said focus member for movement therewith, said cam member having first and second cam surfaces of different slopes;

first and second cam followers integral with said primary lens; and

spring means for (1) urging said first cam follower into abutment with said first cam surface when said converter lens is out of axial alignment with said primary lens and (2) urging said second cam follower into abutment with said second cam surface when said converter lens is in axial alignment with said primary lens, whereby, when said focus member is moved a given distance, said primary lens will move one distance if the converter lens is axially aligned with the primary lens and different distance if the converter lens is not so aligned with the primary lens.

3,882,521

PHOTOGRAPHIC APPARATUS

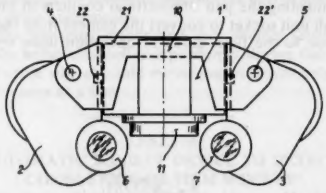
Hans Werner Johannsen, Hegebachstrasse 46, 6333 Braunfels, Germany

Filed Oct. 10, 1972, Ser. No. 296,086
Claims priority, application Germany, Oct. 14, 1971, 2151123
Int. Cl. G03b *29/00*
U.S. Cl. 354—79 **4 Claims**

1. A dual-purpose optical instrument comprising:

a frame having a pair of lateral portions provided with respective eyepieces and objectives together constituting a binocular telescope with a pair of parallel optical axes defining an axial plane; and

a camera body supported on said frame between said lateral portions, said body being provided with a film chamber, a camera objective disposed centrally thereon with an optical axis perpendicular to said axial plane in a first position, film-transport means in said chamber defining an image plane parallel to said axial plane in said first position, and a viewfinder bisected by a plane of symmetry of said telescope including the optical axis of said camera objective;



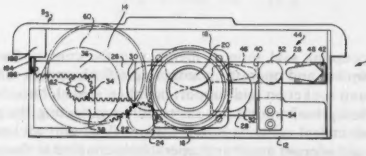
said frame being provided with pivotal mounting means for said body enabling a rotation thereof through 90° from said first position into a second position, with the optical axis of said camera objective swinging in said plane of symmetry into parallelism with said axial plane.

3,882,522

NON-COCKING SPRINGLESS SHUTTER DEVELOPING TWO PARAMETER EXPOSURE REGULATION

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 22, 1973, Ser. No. 362,926
Int. Cl. G03b *7/08, 9/08*
U.S. Cl. 354—30 **17 Claims**



1. A photographic exposure control system for a camera, the camera having means for mounting photographic film material at a given focal plane, a lens for directing image-carrying rays from a scene along a given optical path to the camera focal plane, and selectively operable means for initiating an exposure cycle, said system comprising:

means for sensing the brightness of the scene;

a magnetically detented stepper motor having an output drive pinion, said motor being energizable by a select sequence of electrical pulses to rotate said output drive pinion in a step relation therewith;

a pair of blade members mounted for displacement with respect to each other between a first position blocking the optical path and other positions unblocking the path and defining an aperture valve through which scene light rays are passed to the camera focal plane, each of said blade members having a primary and secondary opening which when displaced into at least partial coincidence with the corresponding opening of the other blade member respectively define a primary aperture value unblocking the given optical path and a secondary aperture value unblocking said brightness sensing means, each of said blade members having rack extension portions coupled in mutually oppositely meshed relation with said motor drive pinion so that said blade members are simultaneously moveable in opposite directions in accordance with mo-

tor operation in a given direction to define progressively changing primary and secondary aperture values;

means responsive to the exposure initiating means for generating a first predetermined sequence of electrical pulses to selectively energize said motor in a first directional sense to displace said blades from said first position to unblock the optical path to define progressively enlarging primary aperture values thereby initiating an exposure interval during which scene light is directed to the focal plane and, in response to said brightness sensing means, for subsequently generating a second predetermined sequence of electrical pulses to selectively energize said motor in an opposite directional sense to displace said blades back to said first position thereby terminating the exposure interval.

14. A method of controlling operation of a photographic shutter arrangement to expose photographic film material comprising the steps of:

evaluating the brightness of a scene to be photographed;

generating a series of electrical pulses corresponding to a desired exposure interval correlated to said evaluation;

feeding said series of electrical pulses to a magnetically detented stepper motor to energize said motor in step with said pulses;

driving a photographic shutter arrangement from said magnetically detented stepper motor in a correlated step relation therewith to define the total amount of scene light impinging on said photographic film in accordance with said evaluation, said driving step including driving said shutter arrangement from said magnetically detented stepper motor to initiate and terminate said exposure interval.

3,882,523

SHOCK-REDUCING STRUCTURE FOR SINGLE LENS REFLEX CAMERAS

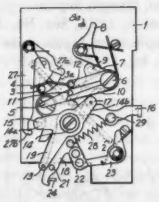
Naoyuki Uno, and Katsuhiko Nomura, both of Kawagoe, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha

Filed Sept. 18, 1973, Ser. No. 398,433

Claims priority, application Japan, Sept. 20, 1972, 47-108438

Int. Cl. G03b *19/12*

U.S. Cl. 354—156 **7 Claims**



1. In a single lens reflex camera, a swingable mirror having a lower viewing position and an upper exposure position, automatic raising means operatively connected with said mirror for automatically raising the latter from said lower viewing position to said upper exposure position thereof in response to initiation of a shutter-releasing operation, manually operable raising means operatively connected with said mirror for manually raising the latter from said lower viewing position to said upper exposure position thereof, drive means operatively connected with said automatic raising means for driving the latter to raise the mirror from said lower viewing position to said upper exposure position thereof, and lock means having a locking position engaging said drive means to prevent the latter from driving said automatic mirror raising means and a release position displaced from said drive means so that the latter is free to drive said automatic mirror raising means, said lock means normally occupying said release position thereof and cooperating at least with said manually operable mirror raising means to be displaced from said release to said locking position when said manually operable raising means raises the mirror to its exposure position, said automatic mirror raising means being operable independently of said manually operable mirror raising means while the latter operates said automatic mirror raising means for transmitting motion therethrough to said mirror so that a portion of said automatic mirror raising means forms part of and is in common with said manually operable mirror raising means, the latter portion of said automatic mirror raising means cooperating directly with the mirror for raising the latter from said lower viewing position to said upper exposure position when either of said mirror raising means operates, said automatic mirror raising means including a swingable driven lever having said portion cooperating directly with said mirror for raising the latter from said lower viewing position to said upper exposure position thereof, and said manually operable mirror raising means including a swingable lever operatively connected with said driven lever for manually swinging the latter to raise the mirror through said portion of said lever of said automatic raising means which cooperates directly with siad mirror.

3,882,524

APPARATUS FOR HOLDING A CAMERA READY FOR USE

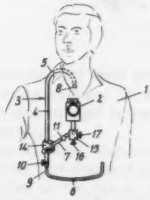
Georg Rauscher, Stuttgart, Germany, assignor to Ingeborg Rauscher, Stuttgart, Germany

Filed Sept. 13, 1973, Ser. No. 396,714

Claims priority, application Germany, Oct. 3, 1972, 2248379

Int. Cl. G03b *17/56*

U.S. Cl. 354—293 **5 Claims**



1. A support apparatus for holding a camera in front of a user consisting essentially of a rod system, said rod system comprising:

a single longitudinally extending rod portion,

a single suspending member connected to said rod portion at a first end thereof,

a supporting member connected to said rod portion at a second end thereof, said supporting member being attached to the rod system in such a manner as to be able to pivot around the longitudinal axis of said rod portion, and

a holder member connected to said rod portion intermediate of said first and second ends thereof,

said rod system being supported on a body of a user by means of said single suspending member extending over only one shoulder of said user and by means of said supporting member resting against said body approximately at the belt line thereof, said supporting member resting aginst said body at only two points thereof, wherein said rod system is supported on said body such that said single longitudinally extending rod portion and said holder member are supported free from contact with the chest of said user, whereby said rod system is uneffected by breathing motions of said user,

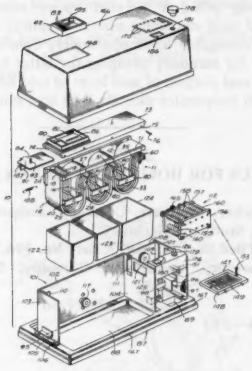
wherein said supporting member is formed of a rod having one end inserted into said second end of said single longitudinal rod portion and is retained by means of a setscrew extending through a cross slot in said second end.

3,882,525

AUTOMATIC FILM PROCESSOR FOR DENTAL X-RAY FILM

Ernst Zwettler, 2101 Hollister Ter., Glendale, Calif. 91206

Filed Sept. 5, 1973, Ser. No. 394,536
Int. Cl. G03d *17/00*
U.S. Cl. 354—316 9 Claims



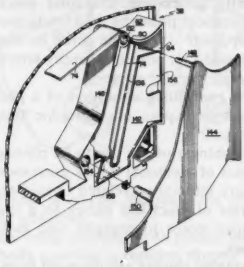
1. A processor for film chips comprising:
a series of tanks;
transport means including a rear vertical wall having a pair of parallel, spaced, walls laterally extending therefrom, said spaced walls having curved portions thereof extending down into and up out of each said tanks and curved portions thereof extending from each tank over into the succeeding tank;
a plurality of laterally spaced grooves formed on the opposing surfaces of said spaced walls, each groove on one wall associated with a groove on the opposite wall to form a pair of opposing grooves lying in a common vertical plane extending parallel to the plane of said rear vertical wall and forming a path through the spaced walls for a vertically oriented film chip;
a lower laterally extending arm having a radial member mounted for rotation about an axis disposed normal to the rear vertical wall and substantially at the center of each curved portion of the spaced walls extending down into and up out of each of said tanks; and
an upper laterally extending arm having a radial member mounted for rotation about an axis disposed normal to the rear vertical wall and substantially at the center of each curved portion of the spaced walls extending from a tank over into a succeeding tank;
each said lower arm synchronized to rotate with an upper arm so that when said lower arm lifts film chips along their paths out of a tank the upper arm continues to lift the film chips and transfers them along their paths into the succeeding tank.

3,882,526

PHOTOGRAPHIC PROCESSING APPARATUS EMPLOYING DELAYED ACTION EXPANDABLE SPONGE

Irving S. Lippert, Lexington, and Joseph A. Stella, West Peabody, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 19, 1973, Ser. No. 416,763
Int. Cl. G03d *5/00*
U.S. Cl. 354—317 18 Claims



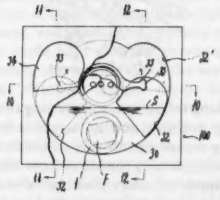
1. A film handling cassette comprising:
a housing configured to retain a strip of photographic film; processing means including an applicator configured to receive means for retaining a quantity of processing fluid to be selectively applied to such a strip of photographic film subsequent to its exposure to process such film; and absorption means positioned relative to said applicator so as to directly contact said processing fluid and means associated with said absorption means to prevent it from absorbing said processing fluid during the application of said processing fluid to such film, and to permit said absorption means to absorb processing fluid remaining subsequent to said application.

3,882,527

METHOD AND APPARATUS FOR AUTOMATICALLY DEVELOPING SMALL FILM

Ryosaku Sawada, Nishinomiya, and Tsutomu Sato, Nadaku, both of Japan, assignors to Kabushiki Kaisha Hanshin Gijutsu Kenkyusho, Hyogo, Japan

Filed June 6, 1973, Ser. No. 367,438
Claims priority, application Japan, June 10, 1972, 47-57983
Int. Cl. G03d *3/10*
U.S. Cl. 354—322 30 Claims



1. A method for automatically developing particularly small size film, such as dental X-ray film and the like, said method comprising the steps of:
a. attaching a single piece of film in a planar condition within a single generally annular, rigid, frame-like film holder having an outer periphery and major and minor planes; said attaching being generally in the medial plane of thickness of said rigid film holder which medial plane is coplanar with and essentially constitutes the major plane of said film holder; and

b. moving said annular film holder by rotatively enaging it along at least part of its outer periphery and passing is successively through a plurality of vertical parallel bath chambers in succession by passing said film holder in alternatingly opposite directions for each successive bath chamber for film development utilizing the successive rotative travel imparted to said film holder while maintaining said film holder with its major plane vertically disposed and parallel with partition walls forming said bath chambers;

c. said moving and passing including lifting said film holder up adjacent to open transfer window means in said partitions, moving said holder through or across said open transfer window means; and

d. allowing said film holder to drop by gravity into the adjacent bath chamber whereby it is again moved as per paragraphs (b) and (c) through the adjacent chambers.

3,882,528

SEMICONDUCTOR DEVICE FOR PRODUCING OR AMPLIFYING HIGH-FREQUENCY ELECTROMAGNETIC OSCILLATIONS

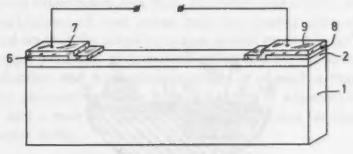
Dominique Boccon-Gibod, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 265,330, June 22, 1972, abandoned. This application Oct. 2, 1973, Ser. No. 402,803

Claims priority, application France, June 24, 1971, 71.22983

Int. Cl. H01l *9/00*

U.S. Cl. 357—3 **8 Claims**



1. A semiconductor device for producing or amplifying high frequency electromagnetic oscillations, said device comprising:

a. a semiconductor layer having a first conductivity type and characterized by a two-valley band structure;

b. two spaced electrodes respectively comprising an anode and a cathode located at and forming ohmic contacts with said layer, said semiconductor layer, anode and cathode comprising a Gunn diode structure, whereby a negative differential resistance can be produced by applying an electric field between said anode and cathode; and

c. at least said anode having a first metal layer in ohmic contact therewith at a first portion of said first metal layer and a second portion of said first metal layer disposed between said anode and cathode and forming a Schottky-diode type rectifying contact with an active part of said semiconductor layer adjoining said anode.

3,882,529

PUNCH-THROUGH SEMICONDUCTOR DIODES

Raymond M. Warner, Jr., Palm Beach, Fla., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 673,467, Oct. 6, 1967, abandoned. This application June 21, 1973, Ser. No. 372,462. The portion of the term of this patent subsequent to May 6, 1990, has been disclaimed.

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 357—13 **2 Claims**

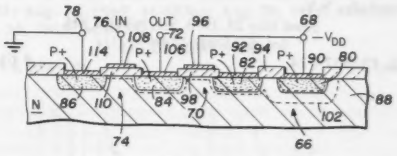
1. In an integrated semiconductor circuit, a punch-through device for voltage regulation comprising:

a semiconductor body of a first conductivity type having a planar surface,

an elongated relatively highly doped first region of a second conductivity type disposed in said semiconductor body and extending to the planar surface of said semiconductor body,

a plurality of relatively highly doped second regions of said second conductivity type disposed in said semiconductor body and extending to the planar surface thereof, said plurality of second regions being spaced from said elongated first region and disposed along the length thereof, terminal means ohmically connected to at least said elongated first region,

said plurality of second regions being disposed in relatively closely spaced relationship with respect to said elongated first region with progressively increasing distance between each successive region and said elongated first region, to define a plurality of semiconductor junctions with said semiconductor body having depletion regions



which respectively interact upon the application of progressively increasing voltages to said terminal means wherein each of said voltages is less than the avalanche voltage of the device,

an elongated relatively highly doped third region of said second conductivity type disposed in said semiconductor body and extending to the planar surface thereof, said third region being located on the side of said plurality of second regions opposite from that of said elongated first region and being in spaced relationship with respect to said plurality of second regions,

an insulating layer overlying the space between said elongated third region and said plurality of second regions,

an elongated gate electrode on said insulating layer,

a terminal ohmically connected to said gate electrode, and said device comprising a punch-through diode and said plurality of second regions cooperating with said elongated third region to define enhancement mode channels providing an enhancement mode metal oxide semiconductor device in series with said punch-through diode.

3,882,530

RADIATION HARDENING OF MOS DEVICES BY BORON

Vitaly Danchenko, Lanham, Md., assignor to United States Government, Washington, D.C.

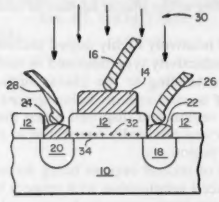
Division of Ser. No. 206,266, Dec. 9, 1971, Pat. No. 3,799,813. This application Sept. 4, 1973, Ser. No. 394,206

Int. Cl. H01l *11/14*

U.S. Cl. 357—23 **5 Claims**

1. A MOS field-effect device exhibiting a reduced gate threshold potential shift sensitivity to ionizing radiation, said device comprising a substrate of semiconductor material, a gate electrode, an insulating film of oxide disposed between said gate electrode and said semiconductor substrate, and element means in said oxide film disposed only at the semicon-

ductor-insulator interface providing acceptors in the semiconductor lattice, said element means substantially annihilating



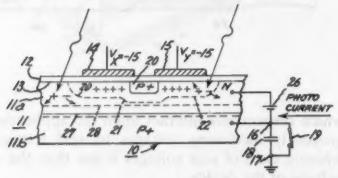
accumulated radiation induced positive charges in said oxide at room temperature.

3,882,531

APPARATUS FOR SENSING RADIATION AND PROVIDING ELECTRICAL READ OUT

Gerald J. Michon, Waterford, and Hubert K. Burke, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 29, 1973, Ser. No. 364,345
Int. Cl. H01 *15/00, 11/14*
U.S. Cl. 357—24 **5 Claims**



1. A radiation sensing device comprising

a substrate of semiconductor material of one conductivity type having a major surface,

a first conducting member overlying a first portion of a region of said substrate adjacent said major surface and in insulating relationship therewith,

a second conducting member overlying a second portion of said surface adjacent region of said substrate and in insulating relationship therewith,

means for coupling said first and second portions of said surface adjacent region,

a first voltage means for providing a first voltage between said first conducting member and said substrate to deplete said first portion of majority charge carriers,

a second voltage means for providing a second voltage between said second conducting member and said substrate to deplete said second portion of majority charge carriers,

means for exposing said substrate to radiation whereby minority carriers generated in said portions are stored therein,

means for collapsing said first voltage to cause charge stored in said first portion to flow into said second portion,

means for collapsing said second voltage whereby charge stored in said second portion is injected into said substrate,

capacitive means in series circuit with the capacitor formed by said second conducting member and said substrate for integrating a first displacement current flow in said series circuit in response to the collapsing of said second voltage thereon,

a region of opposite conductivity type in said substrate spaced from and adjacent to both of said portions of said surface adjacent region of one conductivity type,

means for conductively connecting said region of opposite conductivity type to said substrate to deplete mobile carriers from the vicinity of the PN junction formed between said region of opposite conductivity and said substrate,

whereby minority charge carriers injected into the substrate are substantially collected and removed from said substrate without substantially altering the charge on said capacitive means,

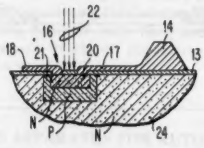
means for reestablishing said second voltage on said second conducting member whereby a second displacement current flows in said series circuit in response to the reestablishment of said second voltage, the time integrated first and second displacement current flows in said capacitive means constituting a measure of said stored charge.

3,882,532

EXTERNALLY ACCESSING MECHANICALLY DIFFICULT TO ACCESS CIRCUIT NODES IN INTEGRATED CIRCUITS

Hubert F. Quinn, Ossing, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 268,407, July 3, 1972, Pat. No. 3,801,910.
This application Dec. 26, 1973, Ser. No. 428,609
Int. Cl. H01 *11/00, 15/00*
U.S. Cl. 357—29 **2 Claims**



1. In a semiconductor integrated circuit structure comprising a semiconductor substrate surface from which a plurality of regions of different conductivity types extend into the substrate to provide the active and passive devices of the circuit, a layer of insulative material covering said surface, a plurality of electrical contacts extending through openings in said insulative layer respectively to said regions, and a metallization pattern formed on said insulative layer respectively connecting a plurality of chip terminals formed on said insulative layer to different regions through said contacts,

the improvement comprising the combination of

at least one externally accessible circuit terminal,

a plurality of photoconductive semiconductor devices formed at said surface of said substrate,

a plurality of first conductive connecting means on said insulative layer, each respectively extending through said insulative layer to contact one of said photoconductive devices and connecting said photoconductive device to said externally accessible terminal, and

a plurality of second conductive connecting means on said insulative layer, each respectively extending through said layer to respectively contact one of said photoconductive devices and connecting said photoconductive device to a respective one of said chip terminals,

said photoconductive devices being normally nonconductive but adapted to conduct when selectively exposed to light to thereby provide a conductive path from the chip terminal to which the exposed device is connected, through the exposed device to the externally accessible circuit terminal.

3,882,533
SEMICONDUCTOR DEVICE

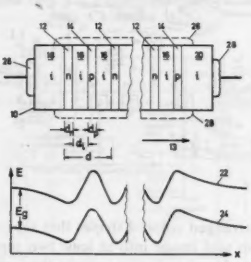
Gottfried Heinrich Döhler, Nurtingen, Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Gottingen, Germany

Filed July 2, 1973, Ser. No. 375,534

Claims priority, application Germany, Dec. 15, 1972, 2261527

Int. Cl. H05b *33/00*

U.S. Cl. 357—58 **23 Claims**



1. A Semiconductor device comprising: a body of semiconductor material with a given energy gap and a given lattice constant, said body including a plurality of zones which in a given direction constitute a succession of alternatingly n-conductive and p-conductive zones having a given excess of donors and acceptors, respectively, each of whose thickness in said given direction is less than 10^3 times said lattice constant, the thicknesses of said zones and the doping thereof being adjusted so that the amplitude and spatial period length of the wave-type potential distribution produced by the alternating p-conductive and n-conductive zones is of such a magnitude that the alternating effect between states in adjacent zones is small; and a pair of spaced contact electrodes on said semiconductor body.

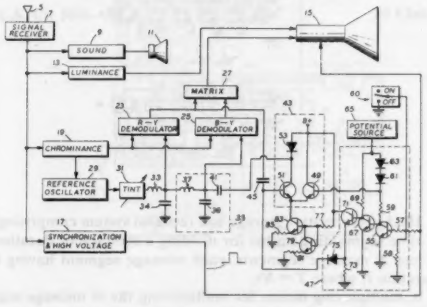
3,882,534
GATED AUTOMATIC TINT CONTROL CIRCUIT

Gopal Krishna Srivastava, Amherst, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 20, 1973, Ser. No. 381,251

Int. Cl. H04n *9/12*

U.S. Cl. 358—28 **8 Claims**



1. In a color television receiver having chrominance and reference oscillator signal sources, a gated tint control circuit comprising:

first demodulator means coupled to said chrominance and reference oscillator signal sources;

second demodulator means coupled to said chrominance signal source;

phase shift network means coupled to said reference oscillator signal source and to said first and second demodulator means;

bias potential development means coupled to the output of one of said first and second demodulator means and to synchronization and high voltage development means; and

switching means coupled to said phase shift network means and to said bias potential development means, said switching means altering said phase shift network to effect alterations in the phase angle of signals applied to said first and second demodulators in accordance with polarity reversal of a signal from said output of said one demodulator means whereby flesh tones are enhanced while green signal response remains substantially unaltered.

3,882,535
COLOR TELEVISION IMAGE PICKUP APPARATUS PROVIDING FREQUENCY INTERLEAVED COLOR CARRIERS AND SIDEBANDS

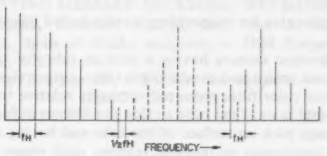
Yasuo Takeumra, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 31, 1970, Ser. No. 68,459

Claims priority, application Japan, Aug. 30, 1969, 44-68385; Aug. 30, 1969, 44-68386; Aug. 30, 1969, 44-68387; Aug. 30, 1969, 44-68388

Int. Cl. H04n *9/06*

U.S. Cl. 358—44 **5 Claims**



1. A color television image pickup apparatus comprising:

an optical system including a color striped filter including a plurality of first and second stripe elements, said first and second stripe elements being equally spaced blocking elements for blocking first and second color lights, respectively, said first stripe elements being dimensioned and inclined relative to the direction of a horizontal scanning line so that image signal components obtained upon each alternate scan by a scanning electron beam have a phase difference of 180° with respect to each other relative to the signal period corresponding in time to the scanning of each first element of said stripe filter, said second stripe elements being dimensioned and superimposed on said first stripe elements at different pitches than said first stripe elements and at different angles of inclination than said first stripe elements relative to said direction of horizontal scanning so that:

image signal components of the second stripe elements obtained upon each alternate scan have a carrier frequency which is higher than that of said image signal components corresponding to said first stripe element;

that the frequency of the color signal corresponding to said first stripe elements is interleaved with that of the color signal corresponding to said second stripe elements and the horizontal scanning frequency component of the color television signals; and

that the image signal components of the second stripe elements obtained upon each alternate scan have the same phase relationship with respect to each other relative to the signal period corresponding in time to the scanning of each second stripe element; and

receiving means responsive to light transmitted through said filter for forming color television signals having the frequency components corresponding to said respective first and second stripe elements.

3,882,536

COLOR INFORMATION ON BLACK AND WHITE FILM

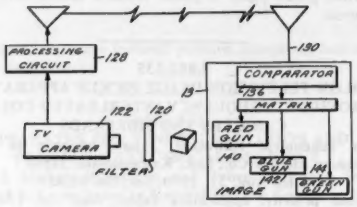
Thomas F. Hanlon, 337 Tremont Ave., Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 84,570, Oct. 28, 1970, Pat. No. 3,715,461. This application Oct. 19, 1972, Ser. No. 299,126. The portion of the term of this patent subsequent to Feb. 6, 1990, has been disclaimed.

Claims priority, application Germany, Oct. 23, 1971, 2152911

Int. Cl. H04n *9/07*

U.S. Cl. 358—44 **6 Claims**



1. Apparatus for transmitting a color coded image comprising:

a television camera having a pick-up tube for receiving a scene image and producing a video output signal and

a three color filter mounted vertically relative to the horizontal scan of the tube so that the filter is in focus on the image pick-up surface of the tube and having a plurality of contiguous rectangular regions, each region including three and only three non-white portions, the portions in each region being contiguous and in a fixed order, and each region including a red responsive portion with a length extending the length of said filter and a first width, a blue responsive rectangular portion with a length extending the length of said filter and a second width differing from said first width and a green responsive rectangular portion with a length extending the length of said filter and a third width differing from said first and second widths, and disposed between said image and said video input so that said camera produces a color coded video output signal.

3,882,537

COLOR TELEVISION CAMERA AND A STRIP-FILTER SUITABLE THEREFORE

Sing Liong Tan, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

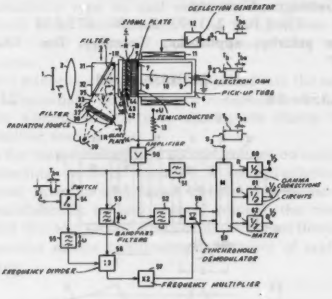
Filed Oct. 1, 1973, Ser. No. 402,453

Claims priority, application Netherlands, Oct. 14, 1972, 7213942

Int. Cl. H04n *9/06*

U.S. Cl. 358—45 **21 Claims**

1. A color television camera for imaging an object illuminated with visible radiation comprising an image detector sensitive to light in the visible range and outside the visible range, a source of light radiation having a frequency outside the visible range, means for projecting the light from the source to the image detector through an optical path, said optical path comprising first and second portions, means for projecting an image of the illuminated object to the image detector along an optical path including a third portion spatially separated from said first portion and including said second portion, a specific index strip-filter in the second portion and provided with alternating filter strips and clear areas that both affect visible light in the same manner, said strip-filter stripes suppressing radiation outside the visible range, and a color strip-filter serially aligned with the specific index filter in the second portion of the optical paths and having



sequentially arranged colored stripes that separate the visible radiation from said image into at least two separate spectral components and pass radiation outside the visible range uniformly.

3,882,538

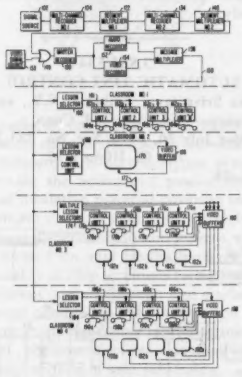
MULTIPLE ACCESS MESSAGE RETRIEVAL SYSTEM

Virgil L. Lowe, Alexandria, Va., assignor to Edutron, Incorporated, Gainesville, Fla.

Continuation of Ser. No. 129,470, March 30, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,335

Int. Cl. H04n *5/78*

U.S. Cl. 360—9 **25 Claims**



18. An information storage and retrieval system comprising:

a. time segmenting means for dividing a message of duration T into N message segments, each message segment having a duration t, where $T = Nt$;

b. multiplexing means for multiplexing the N message segments into a multiplexed message signal having a duration t;

c. demultiplexing means for demultiplexing the multiplexed message signal into the N message segments; and

d. output means for providing an output signal of the message and incuding an audio output device for providing an audio output signal of recorded audio message, a video output device for providing a video output signal of recorded video messages and control means coupling said

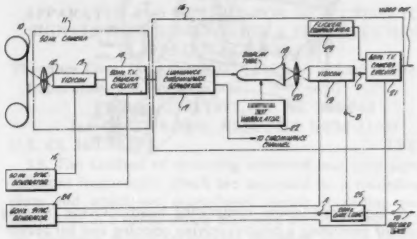
output means with said demultiplexing means for applying each of the *N* message segments in turn to the output means.

3,882,539

METHOD AND APPARATUS FOR IMPROVED SKIP FIELD RECORDING

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Filed Feb. 12, 1973, Ser. No. 331,785
Int. Cl. H04n *5/76*
U.S. Cl. 360—11 **19 Claims**



1. The method of skip field recording wherein certain ones of a plurality of successive individual video signals are recorded as composite video signals, the individual video signals not being recorded, comprising the steps of;

producing a multitude of successive series of video signals, each series comprising a plurality of individual video signals,

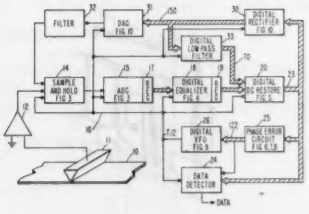
combining certain ones of said plurality of individual video signals in each series into a composite video signal, and recording each of the successive composite video signals on a recording medium, the individual video signals in each series being unrecorded.

3,882,540

READBACK CIRCUITS FOR DIGITAL SIGNAL RECORDERS

Hjalmar H. Ottesen, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 17, 1974, Ser. No. 480,072
Int. Cl. G11b *5/09*
U.S. Cl. 360—39 **10 Claims**



1. A readback circuit for a digital signal recorder, sensing means for generating a readback signal having periodic bit periods T,

the improvement including in combination:

sample and hold means receiving said readback signal and holding sampled signal amplitudes;

a digital-to-analog converter circuit (DAC) for repeatedly converting said held sampled signal amplitudes to first sets of digital signals, each set including a sign signal;

a gated DAC register receiving said first set of digital signals;

a first digital signal processing circuit receiving said first sets of digital signals and operative to generate second sets of digital signals, each including a sign signal, based upon said first sets of digital signals in accordance with a given transfer function;

timing means responsive to successive ones of said second sets of digital signals to adjust its operation to supply timing signals in accordance with said bit periods T;

said sample and hold means responsive to said timing signals to receive said readback signal at least at bit period boundaries;

said timing signals actuating said gated DAC register to receive said first sets of digital signals after each receipt of said readback signal amplitudes by said sample and hold means and further actuating said digital signal processing circuit to operate synchronously with said bit periods;

digital-to-analog converter means responsive to said second sets of digital signals to supply a bias signal related to a magnitude represented by successive ones of said second sets of digital signals; and

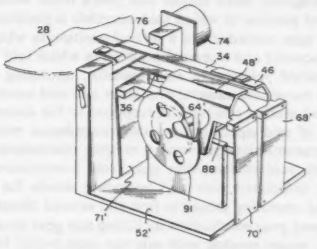
means in said sample and hold means responsive to said bias signal to adjust said sampled signal amplitude in accordance therewith.

3,882,541

ROTATING MEMORY ACCESSING MECHANISM

Sanjoy Ghose, Redwood Estates, and Paul A. Gilovich, Saratoga, both of Calif., assignors to IBM Corporation, Armonk, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,454
Int. Cl. G11b *5/52*
U.S. Cl. 360—78 **25 Claims**



1. A disk file accessing system for advancing a magnetic head assembly to successive tracks comprising:

a head assembly support device coupled to said magnetic head assembly for movement substantially along a selected axis;

cam follower means coupled to said support device;

cam means having a peripheral cam surface adjacent said cam follower defining circumferential increments at varying radii from a selected axis of rotation;

motor means coupled to rotate said cam means about said axis of rotation in incremental movements corresponding to the circumferential increments;

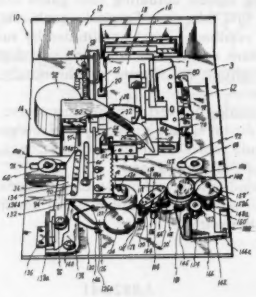
and flexural means coupled to and supporting said support device and disposed to mechanically bias said cam follower means into engagement with the peripheral cam surface of said cam means.

3,882,542

CASSETTE TYPE TAPE RECORDER USING PLANETARY GEARING

Niro Nakamichi, Tokyo, Japan, assignor to Nakamichi Research, Inc., Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,852
Claims priority, application Japan, Oct. 23, 1972, 47-10592
Int. Cl. G11b *15/00, 23/08*
U.S. Cl. 360—96 10 Claims



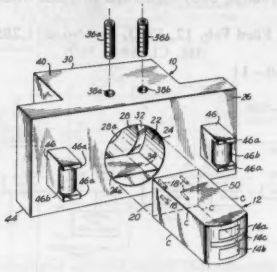
1. A cassette type tape recorder comprising a cassette including a tape therein; a cassette container into which said cassette is inserted and from which said cassette is removed, said cassette container having a first position in which said cassette is positioned for playing the tape recorder and a second position in which said cassette is positioned for insertion into or removal from said cassette container; an assembly including magnetic head means and pinch roller means and having a first position in which said assembly is positioned for playing the tape recorder and a second position in which said assembly recorder and a second position in which said assembly is retracted relative to said cassette; operating means movable to move said cassette container and said assembly to said first and second positions in response to the direction of movement of said operating means; transmission means including a transmission gear and a reverse transmission gear meshed with said transmission gear, said transmission gear operatively associated with said operating means for movement of said operating means in first and second directions; a sun and planet gear mechanism including sun gear means and planet gear means meshed with said sun gear means for rotation about its axis and about an axis of said sun gear means, said transmission gear and said reverse transmission gear disposed on the orbit of said planet gear means of said sun and planet gear mechanism; power supply to selectively drive said tape in one and another directions and to drive said sun and planet gear mechanism in one direction; and locking means to selectively lock said sun and planet gear mechanism so as to mesh said planet gear means with one of said reverse transmission gear and said transmission gear of said transmission means whereby upon said operating means positioned to place said cassette container and said assembly in said first position and said locking means locks said planet gear means to be meshed with said reverse transmission gear of said transmission means for movement of said cassette container and said assembly to said second position and upon said operating means positioned to place said cassette container and said assembly in said second position said locking means locks said planet gear means to be meshed with said transmission gear of said transmision means for movement of said cassette container and said assembly to said first position.

3,882,543

TAPE HEAD MOUNT AND ALIGNMENT MEANS

William D. Richards, Medway, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 10, 1973, Ser. No. 396,026
Int. Cl. G11b *5/56, 21/24*
U.S. Cl. 360—109 7 Claims



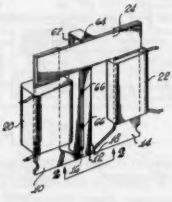
1. A tape head mount comprising headreceiving opening means for providing a head-receiving opening and for receiving therein a tape head of generally rectangular cross-section, said head-receiving opening having cylindrical inner surface means for supporting the tape head in the vicinities which receive the edges of the tape head, means for limiting the insertion of the tape head within said head-receiving opening, a pair of tape guides disposed on opposite sides of said head-receiving opening in the direction of tape travel, and a pair of screw means extending into said head-receiving opening means for bearing against the same side of an inserted tape head, said screw means in cooperation with said cylindrical inner surface means for controlling the rotation of the tape head within said head-receiving opening around the substantially central axis of said cylindrical inner surface means which axis remains fixed near the center line of the tape guides in the direction of tape travel.

3,882,544

COMBINED WIDE-ERASE AND READ-WRITE MAGNETIC HEAD

Gordon Frierson Hughes, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1973, Ser. No. 424,871
Int. Cl. G11b *5/26, 5/28*
U.S. Cl. 360—118 9 Claims



1. A combined erase and read-write magnetic head, comprising:

an elongated magnetic recording surface having a longitudinal dimension and a substantially constant width transverse to said longitudinal dimension;

an erase magnetic circuit having an erase gap in said recording surface, the length of said gap being along said longitudinal dimension of said surface and the width of said gap being transverse to said longitudinal dimension across the entire width of said surface, said erase gap being

sufficiently long compared to said width of said erase gap to permit the generation of effective erasing magnetic fields beyond the ends of said width of said erase gap;

a read-write magnetic circuit having a read-write gap in said recording surface spaced from said erase gap, the length of said read-write gap being in the direction of said longitudinal dimension and the width of said read-write gap being transverse to said longitudinal dimension across the entire width of said surface and substantially the same width as said erase gap, said erase magnetic circuit and said read-write magnetic circuit having a common magnetic path between said erase gap and said read-write gap.

3,882,545

APPARATUS AND METHOD FOR DETECTING TONE SIGNALS OCCURING WITHIN A PREDETERMINED FREQUENCY RANGE

Theodore Titus, IV, Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Filed Nov. 15, 1972, Ser. No. 306,544

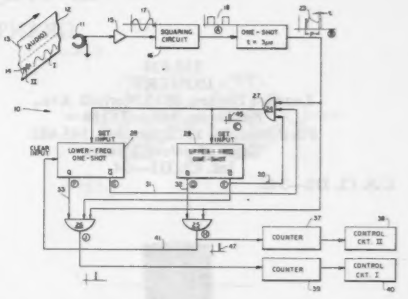
Int. Cl. G11b *5/00;* **H03k** *5/20;* **H03d** *13/00*

U.S. Cl. 360—137 **13 Claims**

13. The method of detecting either of two tone signals of different frequencies which are recorded on a recording medium and which are reproduced during recording medium movement at a speed which may vary within a range of possible playback speeds to provide playback signals having frequencies which are within two mutually exclusive ranges of playback frequencies, comprising the steps of:

establishing a first period of time which commences in response to the occurrence of a frequency cycle of said playback signal and which terminates after a predetermined certain time not less than the period of the lowest playback frequency within the range of possible playback frequencies corresponding to the higher of said recorded frequencies;

establishing a second period of time which commences no earlier than the termination of said first period of time and which has a predetermined certain duration not less than the period of the lowest frequency of the playback frequency range corresponding to a lower one of said recording frequencies;



detecting the occurrence of the next frequency pulse only during said first period of time to denote the occurrence of a tone signal having said higher recording frequency; and

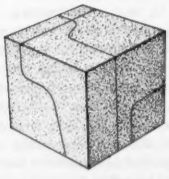
detecting the occurrence of the next frequency pulse only during said second period of time to denote the occurrence of a tone signal having said lower recording frequency.

DESIGNS

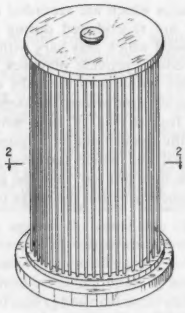
GRANTED MAY 6, 1975

235,038
HOSIERY
Leander Lockes, 3815 Norfolk Ave., Baltimore, Md. 21216
Filed Mar. 28, 1973, Ser. No. 345,682
Term of patent 7 years
Int. Cl. D2—*04*
U.S. Cl. D2—342

235,039
FURNITURE ASSEMBLY COMPOSED OF SEVEN INTERRELATED ARTICLES
Robert J. Olsen, 11 Waverly Place, New York, N.Y. 10003
Filed Apr. 13, 1970, Ser. No. 22,401
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—4

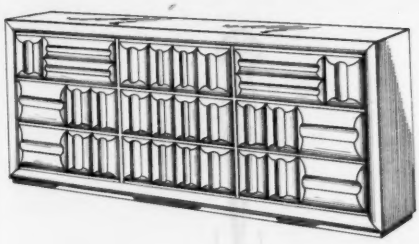


235,040
GREETING CARD DISPLAY HOLDER
Thomas C. Wright, Chicago, Ill., assignor to Charles Davis III, Grosse Point, Mich.
Filed May 3, 1973, Ser. No. 356,738
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—20

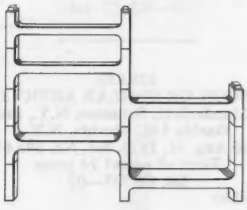


235,041
DISPLAY CASE
Howard Nathan, New York, and Frank X. Schoen, Brooklyn, N.Y., assignors to Textron Inc., Providence, R.I.
Filed Apr. 13, 1973, Ser. No. 350,898
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—23

235,042
DRESSER
Aaron Donner, Weston, Conn., assignor to The Lane Company
Filed July 10, 1974, Ser. No. 487,377
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

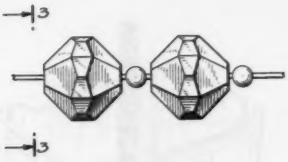


235,043
SHELVING UNIT
Arnold C. Martinelli, Lake Shore Drive, Rawdon, Quebec, Canada
Filed Mar. 30, 1973, Ser. No. 346,449
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

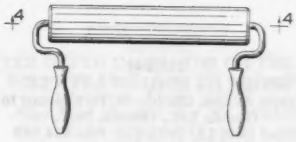


235,044
DECORATIVE PANEL FOR FURNITURE DOOR, DRAWER FRONT, HEADBOARD OR THE LIKE
Aaron Donner, Weston, Conn., assignor to The Lane Company
Filed July 10, 1974, Ser. No. 487,380
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

235,045
BEAD STRAND FOR A CURTAIN ELEMENT OR THE LIKE
Irving Levine, 5212 Weller Drive, Woodland Hills, Calif. 91364
Filed Mar. 7, 1969, Ser. No. 16,110
Term of patent 14 years
The term of this patent subsequent to Aug. 6, 1985, has been disclaimed
Int. Cl. D6—*10*
U.S. Cl. D6—205



235,046
ROLLING PIN
J. Henry Adams, 64 Onyx Ave., Walla Walla, Wash. 99326
Filed Mar. 26, 1973, Ser. No. 344,853
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—99



235,047
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Aug. 31, 1973, Ser. No. 393,654
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

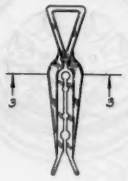
235,048
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 12, 1973, Ser. No. 424,168
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

235,049
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 12, 1973, Ser. No. 424,169
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

235,050
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 26, 1973, Ser. No. 427,921
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

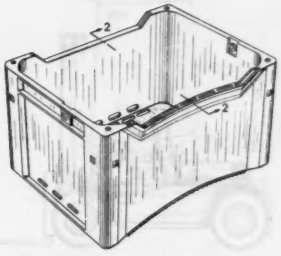
235,051
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Aug. 31, 1973, Ser. No. 393,655
Term of patert 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—150

235,052
CLOTHES PIN
Douglas Arthur Davidson, 4 Waimana Road, Takanini, Auckland, New Zealand
Filed May 7, 1973, Ser. No. 357,706
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—198



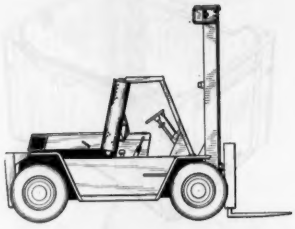
235,053
PICK UP TOOL
Raymond B. Nockleby, Rte. 1, Kalispell, Mont. 59901
Filed Oct. 15, 1973, Ser. No. 406,376
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—52

235,054
FRUIT BOX OR THE LIKE
Gilbert Lucien Herman, Domaine de Castang, G.F.A. 24, Bergerac, France
Filed Dec. 27, 1972, Ser. No. 319,040
Claims priority, application France July 19, 1972
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—243



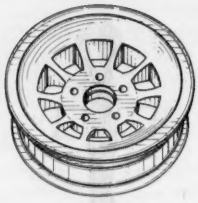
235,055
WATER DEPTH INDICATOR OR THE LIKE
Edward W. McCloskey, 271 Alpine St., Pasadena, Calif. 91106
Filed Mar. 29, 1973, Ser. No. 346,122
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—101

235,056
LIFT TRUCK
Robert G. Neer and Lawrence A. Liljequist, Salem, Norman D. Thompson, Dallas, and Llewellyn L. Walter, Monmouth, Oreg., and William O. Smart, Dunlap, and Robert W. Briggs and Bernard E. Erlacher, Washington, Ill., assignors to Towmotor Corporation, Mentor, Ohio
Filed May 30, 1973, Ser. No. 365,332
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57

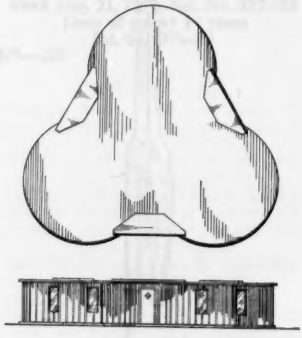


235,057
RIDING TOY
Richard D. Williams, Brentwood, Tenn., assignor to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed Nov. 1, 1973, Ser. No. 412,031
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—108

235,058
WHEEL
Dalton M. Davis, Palos Verdes Estates, Calif., assignor to E-T Industries, Inc.
Filed Oct. 10, 1972, Ser. No. 299,129
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



235,059
BUILDING
Charles R. Turner, Hopkins, Mo. (% Advance Concrete & Asphalt Co., P.O. Box 324, Maryville, Mo. 64468)
Continuation-in-part of abandoned design application Ser. No. 116,296, Feb. 17, 1971. This application May 21, 1973, Ser. No. 362,477
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 E



235,060
PAPER CLAMP
Norihito Tanaka, Osaka, Japan, assignor to Lihit Industrial Co., Ltd., Osaka, Japan
Filed Sept. 7, 1972, Ser. No. 287,005
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—65

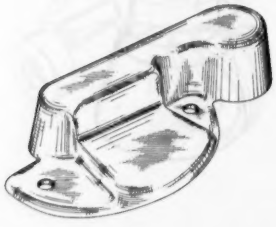
235,061
TAPE DISPENSER
Secondo Vailati, Vedano Olona, Italy, assignor to S.I.A.T. S.p.A., Tradate, Varese, Italy
Filed Feb. 22, 1973, Ser. No. 334,606
Claims priority, application Italy Aug. 23, 1972
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—67

235,062
WATER PURIFIER
Frederick G. Mayer, South Norwalk, Conn. (1700 Summer St., Stamford, Conn. 06905)
Filed Mar. 10, 1972, Ser. No. 205,779
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

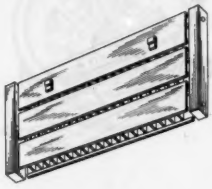
235,063
SPRAYER
Rudolph M. Gunzel, Jr., 1606 Charleton Road, San Marino, Calif. 91108; Tony Radecki, 1340 E. Palm St., Altadena, Calif. 91001; and Robert A. Pinne, 2145 Las Gallinas Ave., San Rafael, Calif. 94903
Filed Aug. 6, 1973, Ser. No. 386,018
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

235,064
SWIVEL SHAMPOO BOWL
Bobby L. Strickland, 10913 N. McKinley, and Doyle E. Simpson, 1200 NW. 104th St., both of Oklahoma City, Okla. 73114
Filed Aug. 15, 1973, Ser. No. 388,646
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—64

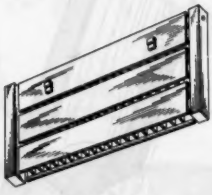
235,065
VENTILATION CONDUIT FOR A WATER CLOSET
Clyde J. Hunnicutt, Jr., 3026 E. Garfield St., Phoenix, Ariz. 85008
Filed Oct. 2, 1972, Ser. No. 293,808
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



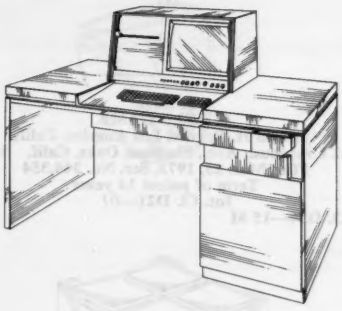
235,066
HEAT CONVECTOR
Gunnar Olaf Vestergaard Rasmussen, % Hudevad Radiatorfabrik Aktieselskab, Aarslev, Denmark
Filed June 19, 1972, Ser. No. 264,290
Claims priority, application Denmark Dec. 20, 1971
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



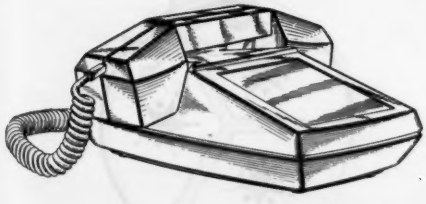
235,067
HEAT CONVECTOR
Gunnar Olaf Vestergaard Rasmussen, % Hudevad Radiatorfabrik Aktieselskab, Aarslev, Denmark
Filed June 19, 1972, Ser. No. 264,291
Claims priority, application Denmark Dec. 20, 1971
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



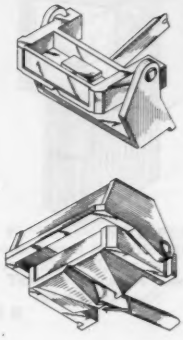
235,068
TEXT EDITING TERMINAL
Kenneth E. Burkhalter, Ann Arbor, Frank L. Hibbard, Farmington, Charles Newman and Charles L. Schaldenbrand, Ann Arbor, and William R. Story, Troy, Mich., assignors to Omnitext, Inc., Ann Arbor, Mich.
Filed Jan. 11, 1973, Ser. No. 322,734
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



235,069
TELEPHONE SET OR SIMILAR ARTICLE
Bruno Todeschini, 25 Via Giovanni Pascoli, Cernusco sul Naviglio, Milan, Italy
Filed June 14, 1973, Ser. No. 369,886
Claims priority, application Italy Mar. 8, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



235,070
PHONOGRAPH STYLUS
Robert L. Deschamps, Wheaton, James P. Thomsen, Mount Prospect, and Ronald G. Thielmann, Arlington Heights, Ill., assignors to Shure Brothers Incorporated
Filed July 20, 1973, Ser. No. 381,066
Term of patent 14 years
Int. Cl. D14—*99, 01*
U.S. Cl. D26—14 D



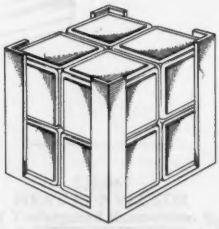
235,071
ELECTRIC LAMP
Bengt Erling Beckman, Alstensgatan 90, S–161 39 Bromma, Stockholm, Sweden
Filed Oct. 10, 1972, Ser. No. 299,183
Claims priority, application Sweden Apr. 7, 1972
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—8

235,072
LIGHTER FOR SMOKERS
Guy Neyret, Francheville, France, assignor to Etablissements Genoud & Cie, Venissieux, Rhone, France
Filed Nov. 30, 1973, Ser. No. 420,673
Claims priority, application France June 13, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

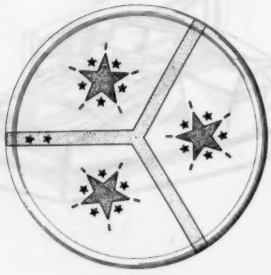
235,073
GAME DIE OR SIMILAR ARTICLE
John C. Warren, Exeter, N.H. 03833
Filed Apr. 20, 1973, Ser. No. 352,968
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 DT

235,074
GOLF PUTTER HEAD
Terrill R. McCabe, Highland Greens, F116 Westchester, Ohio 45069
Original design application Feb. 14, 1972, Ser. No. 226,385, now abandoned. Divided and this application July 11, 1973, Ser. No. 378,166
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

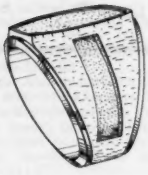
235,075
PUZZLE GAME
William H. Baynes, Los Angeles, Calif. (4122 Greenbush Ave., Sherman Oaks, Calif. 91403)
Filed Mar. 23, 1973, Ser. No. 344,354
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



235,076
FLEXIBLE SPINNING TOY
Donald E. Snyder, P.O. Box 478, Colona, Ill. 61241
Filed Oct. 1, 1973, Ser. No. 402,629
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 W



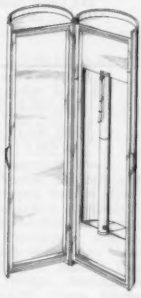
235,077
CLASS RING
Carter Moyer, Houston, Tex., assignor to Stuckey & Speer, Inc., Houston, Tex.
Filed July 26, 1973, Ser. No. 382,943
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B



235,078
LAMP
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004, and James Allan Thomas, 861 Willow Drive, Brea, Calif. 92621
Filed Apr. 30, 1973, Ser. No. 355,558
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

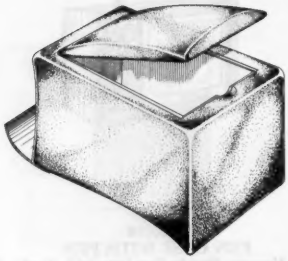
235,079
TELEVISION RECEIVER OR SIMILAR ARTICLE
Soji Ohtsuka, Tokyo, and Kazunori Johdai, Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan
Continuation of abandoned design application Ser. No. 177,542, Sept. 2, 1971. This application June 4, 1973, Ser. No. 366,264
Claims priority, application Japan Mar. 5, 1971
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D

235,080
PEN CASE WITH PEN
Franco Verona, Strada San Vito 350, Turin, Italy
Filed July 30, 1971, Ser. No. 167,888
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D87—1 R

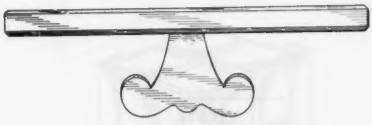


235,081
BED PAN
Julia Gatewood, 18 Pinetop Drive, Central Islip, N.Y. 11722
Filed Oct. 29, 1973, Ser. No. 410,975
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 U

235,082
COMBINED AUTOMOBILE ARMREST AND COOLER BOX
Frank M. Weaver, Safford, Ariz., assignor to T.I.C., Inc.
Filed Apr. 11, 1973, Ser. No. 349,977
Term of patent 14 years
Int. Cl. D3—*01*; D12—*16*
U.S. Cl. D87—1 R



235,083
IDENTIFICATION PLAQUE
Norman V. Crandell, 3788 S. Poplar St., Denver, Colo. 80237
Filed Mar. 9, 1973, Ser. No. 339,579
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 F



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF MAY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Stone, Joseph J., 3,881,349.

A. E. Joslin Machinery & Equipment Limited: *See—*
Wells, William John, 3,881,612.

A. I. Co.: *See—*
Angeski, Joseph P., 3,881,553.

A-T-O Inc.: *See—*
Netteland, Loyal G., 3,881,394.
Thrun, James L., 3,881,634.

AB Mecman: *See—*
Sahlin, Sven Lennart, 3,881,357.

Abalo, Juan Manuel, to Noel y Compania Limitada Sociedad Anonima Argentina de Dulces y Conservas. Conveying means for a mold structure. 3,881,591, Cl. 198-175.000.

Abbott, Allan V. Variable motion bicycle pedal drive system. 3,881,747, Cl. 280-255.000.

Abdurashidov, Gafur Abdushukurovich: *See—*
Arifov, Ubai Arifovich; Kharmats, Dmitry Efimovich; Abdurashidov, Gafur Abdushukurovich; Vzenkonsky, Alexandr Vasilievich; Sapon, Anatoly Dmitrievich; Lavnikanis, Vladimir Fedorovich; Kogan, Mark Isoifovich; Egorov, Nikolai Petrovich; Gomelsky, Jury Danilovich; and Shaidu, Abuzar Gabdurakhmanovich, 3,881,227.

Abegg, Jean-Louis: *See—*
Kalopissis, Gregoire; Abegg, Jean-Louis; Ghilardi, Guiliana; and de Beaulieu, Henri Philippe, 3,882,114.

Ace Glass Co.: *See—*
Tausheck, Russell W., 3,881,618.

Ackley, Donald M. Multicolor light source. 3,882,353, Cl. 315-68.000.

Acme-Cleveland Corporation: *See—*
Rebish, Edward John, 3,881,703.

Acme Highway Products Corporation: *See—*
McMullen, Richard G., 3,881,833.

Acorn Associates, Inc.: *See—*
Reinhardt, Paul W., 3,882,223.

Adler, Karl: *See—*
Jenni, Rene; and Adler, Karl, 3,881,309.

Adomaitis, Domas, to Continental Can Company, Inc. Plastic container with noneverting bottom. 3,881,621, Cl. 215-1.00C.

Advanced Diagnostic Research Corporation: *See—*
Wilcox, Martin H., 3,881,466.

Aero Electronics Development Co., Inc.: *See—*
Koster, Charles A.; and Perry, Wayne E., 3,882,394.

Aero-Flow Dynamics, Inc. (The Wing Co. Division): *See—*
Creuz, Walter R., 3,881,863.

Aerojet-General Corporation: *See—*
Depree, David O., 3,882,018.
Schoenman, Leonard; and Schindler, Robert C., 3,881,701.

Aerostatic Limited: *See—*
Rebbettes, Peter, 3,881,307.

Afanasieva, Irina Ivanovna: *See—*
Pomogailo, Anatoly Dmitrievich; Mambetov, Urakbai Alimbaevich; Sokolsky, Dmitry Vladimirovich; Bolshov, Alexandr Avraamovich; Gluzman, Moisei Kharitonovich; Kochurovskaya, Gerta Gennadievna; Gluzman, Evgeny Moiseevich; Matkovsky, Petr Evgenievich; Beikhold, Galina Albertovna; Afanasieva, Irina Ivanovna; Burymchenko, Mikhail Ivanovich; and Baishiganov, Esengeldy, 3,882,046.

Agence Nationale de Valorisation de la Recherche ANVAR: *See—*
Baulard-Cogan, Raymond Gerard, 3,881,275.
Bonnet, Maurice, 3,882,513.

Agency of Industrial Science & Technology: *See—*
Tato, Masao; Hasegawa, Masaki; and Ichijyo, Taro, 3,882,084.

Agfa-Gevaert Aktiengesellschaft: *See—*
Maier, Albert; Luder, Gunther; and Pfeifer, Josef, 3,881,813.
Ohlschlager, Hans; Riester, Oskar; Ghys, Theofiel Hubert; Verhille, Karel Eugeen; and Vanheertum, Johannes Josephus, 3,881,926.
Winkler, Alfred; and Engelsmann, Dieter, 3,882,519.

Agfa-Gevaert N.V.: *See—*
Claes, Frans Henri, 3,881,934.

Agnew, Jeremy A.: *See—*
Nunley, James A.; and Agnew, Jeremy A., 3,882,285.

Ahrweiler, Karl-Heinz, to Kusters, Eduard. Means for maintaining spacing in a continuous press. 3,881,852, Cl. 425-149.000.

Air Products and Chemicals, Inc.: *See—*
Daniels, Wiley E.; Holland, Dewey G.; and Mantell, Gerald J., 3,882,195.
Dixon, Dale D.; and Urenovitch, Joseph V., 3,882,152.
Petrella, Robert G., 3,882,067.

Aisin Seiki Kabushiki Kaisha: *See—*
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Aitken, Daniel Glen: *See—*
Freake, Ronald; Strenkoski, Leon Francis; Aitken, Daniel Glen; and Haden, Billy Harper, 3,881,993.

Aizawa, Hiroshi: *See—*
Ogiso, Mitsutoshi; Aizawa, Hiroshi; and Iwashita, Tomonori, 3,882,516.

Aktiebolaget Svenska Flaktfabriken: *See—*
Larkfeldt, Birger, 3,881,402.

Alarm Equipment Supplies Limited: *See—*
McSorley, David J.; and De Croos, Jaye, 3,882,492.

Albrecht, Robert J.: *See—*
Griner, Arthur J.; Albrecht, Robert J.; Hoagland, V. H.; and Ignatuk, Daniel, 3,881,298.

Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Fluoranthene derivatives. 3,882,113, Cl. 260-246.00B.

Albright, Alva Z. Tree stabilizer for tree harvesting apparatus. 3,881,615, Cl. 214-147.00G.

Albright, James A.: *See—*
Dorschner, Kenneth P.; and Albright, James A., 3,881,908.

Alcott, Charles A.: *See—*
McLaren, Robin A.; and Alcott, Charles A., 3,882,128.

Aldrich-Boranes, Inc.: *See—*
Brown, Herbert C., 3,882,037.

Alexander, Norman E.: *See—*
McFarlane, Samuel B., Jr.; Burdige, Joseph; and Alexander, Norman E., 3,881,818.

Allanic, Jacques; Beraudy, Philippe; and Guillon, Louis, to Societe Anonyme de Telecommunications. Machines for forming insulation for high frequency transmitting coaxial lines. 3,881,851, Cl. 425-113.000.

Allen-Bradley Company: *See—*
Walters, Ronnie G., 3,882,304.

Allen, Frederick G., to F. G. Allen Associates, Inc. Electronic guitar tuner. 3,881,389, Cl. 84-454.000.

Allen, Marshall T.; and Norris, Darrell E., to Allen, Marshall T. Apparatus and method for priming an engine oil pump. 3,881,460, Cl. 123-196.00S.

Allgood, Jay R.; and Odello, Robert J., to United States of America, Navy. Method for stress wave drilling. 3,881,559, Cl. 175-67.000.

Allied Chemical Corporation: *See—*
Bedell, John Robert, 3,881,541.
Kavesh, Sheldon, 3,881,540.
Largman, Theodore; Schmehl, Leon J.; and Stone, Herman, 3,882,076.
Polk, Donald E.; and Bedell, John R., 3,881,542.
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Pflanz, Herbert M., 3,882,427.

Alontsev, Viktor Stephanovich: *See—*
Barannik, Ivan Andreevich; Belkin, Ivanovich; Borodin, Viktor Ivanovich; Voronova, natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stephanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,881,913.

Altherr, Russell George; and Holibaugh, Ralph William, to Amsted Industries Incorporated. Offset coupling. 3,881,602, Cl. 213-75.00R.

Altseimer, John H.; and Hanold, Robert J., to United States of America, Energy Research and Development Administration. Apparatus and method for large tunnel excavation in soft and incompetent rock or ground. 3,881,777, Cl. 299-33.000.

Aluminum Company of America: *See—*
Staley, James T.; Hunsicker, Harold Y.; and Brown, Robert H., 3,881,966.

Alverth, Ronald W.; and Sander, Frank, to Uniweb International, Inc. Web severing device. 3,881,383, Cl. 83-308.000.

Amann, August: *See—*
Hagen, Helmut; Amann, August; and Giertz, Hubert, 3,882,141.

Amann, Charles A.: *See—*
Sagi, Charles J.; and Amann, Charles A., 3,881,399.

Amato, Carmelo J.: *See—*
Carr, Peter; and Amato, Carmelo J., 3,881,958.

Amburgey, Carl: *See—*
Delph, Bob; and Amburgey, Carl, 3,881,277.

American Aniline Products, Inc.: *See—*
Renfrew, Edgar E., 3,881,866.

American Bank Note Company: *See—*
D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,881,414.

American Cyanamid Company: *See—*
Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, 3,882,149.

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Grant, Norman H.; and Rappaport, Ruth S., 3,882,233.
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American Hospital Supply Corporation: *See—*
McPhee, Charles J., 3,882,026.

American Medical Electronics Corporation: *See—*
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American Optical Corporation: *See—*
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DePedro, Donald; and Cannon, Robert, 3,882,277.
Jones, James A., 3,881,976.
Richards, William D., 3,882,543.
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Ames, Ronald B.: *See—*
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Amity Leather Products Company: *See—*
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Travis, Lawrence R., 3,882,264.

Amsted Industries Incorporated: *See—*
Altherr, Russell George; and Holibaugh, Ralph William, 3,881,602.

Amstutz, Daniel. Convertible chair. 3,881,771, Cl. 297-71.000.

Amtron, Inc.: *See—*
Porter, Virgle E., 3,882,286.

Amundsen, Joseph; Wetzel, William H.; Naimy, Norman; and Goodwin, Robert J., to Reichhold Chemicals, Inc. Composition for treating wood. 3,881,940, Cl. 106-15.0AF.

Anaconda Company, The: *See—*
Pezdark, Ben C.; and Cleary, William C., 3,881,583.

Andersen Laboratories, Inc.: *See—*
Martin, Tom Alan, 3,882,429.

Anderson, Kenneth M., to AVM Corporation. Anti-tilt mechanism. 3,881,793, Cl. 312-217.000.

Anderson, Sherald J.: *See—*
Jewell, Jack; Ferguson, Virgil D.; and Anderson, Sherald J., 3,881,256.

Ando, Shimon; Kurokawa, Koji; Suzuki, Shizuo; Komatsu, Isamu; Suzuki, Toshitaka; Kawano, Shigeyoshi; Sunada, Masayoshi; and Natsuno, Kengi, to Hitachi, Ltd. Unattended travelling vehicle system. 3,881,568, Cl. 180-98.000.

Andrews, Lawrence F. Orthodontic bracket extraction. 3,881,252, Cl. 32-14.00A.

Andrews, Warren L., to Wells Lamont Corporation. Hunter's glove. 3,881,197, Cl. 2-161.00A.

Angeski, Joseph P., to A. I. Co. Lawn aerating and dressing means. 3,881,553, Cl. 172-22.000.

Angier, Robert Bruce: *See—*
Lindsay, Harry Lee; Angier, Robert Bruce; and Murdock, Keith Chadwick, 3,882,123.

Anthony, Norman Howell: *See—*
Crossley, Ian Alexander; Kirk, Geoffrey Eric; Anthony, Norman Howell; and Bamber, Derek Robert, 3,882,210.

Aoki, Toyohiko, to Naigai Kogyo Kabushiki Kaisha. Apparatus for dissolving large quantities of oxygen in water. 3,882,205, Cl. 261-37.000.

Apellaniz, Joseph E., to Powers Chemco, Inc. Photosensitive polymer composition. 3,881,935, Cl. 96-115.00R.

Apex Welding, Incorporated: *See—*
Miller, William T.; and Morgan, William G., 3,881,617.

Apostolico, Martin A.: *See—*
Nieuweboer, Gerrit; and Apostolico, Martin A., 3,882,357.

Apple, Garrett Gordon, Jr., to North Electric Company. Drift compensated phase lock loop. 3,882,412, Cl. 331-1.00A.

Araki, Yasuo; Mishima, Fumiyuki; and Tsukahara, Kenzi, to Janome Sewing Machine Co. Ltd. Type wheel arresting and blocking device. 3,881,411, Cl. 101-45.000.

ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A.: *See—*
Glaesener, Ernest, 3,881,697.

Arco Polymers, Inc.: *See—*
Ceska, Gary W., 3,882,070.

Arifov, Ubai Arifovich; Kharmats, Dmitry Efimovich; Abdurashidov, Gafur Abdushukurovich; Vzenkonsky, Alexandr Vasilievich; Sapon, Anatoly Dmitrievich; Lavnikanis, Vladimir Fedorovich; Kogan, Mark Isoifovich; Egorov, Nikolai Petrovich; Gomelsky, Jury Danilovich; and Shaidu, Abuzar Gabdurakhmanovich. Device for cleaning fibrous materials. 3,881,227, Cl. 19-205.000.

Armstrong, J. Delvin. Oscillating light apparatus. 3,882,306, Cl. 240-48.000.

Arnold, Harold Edward; and Herbert, Joseph Boatner, to du Pont de Nemours, E. I., and Company. Tow processing apparatus. 3,881,230, Cl. 28-1.300.

Aron, Erwin, to Technical Processing, Inc. Novel processing aids for natural and synthetic rubber compounds. 3,882,062, Cl. 260-23.70M.

Arsem, A. Donald, to RCA Corporation. Amplifier blanking circuit. 3,882,407, Cl. 328-221.000.

Artos Engineering Company: *See—*
Gudmestad, Ragnar; 3,881,374.

Arvai, Tibor, to Tokyo Juki Kogyo Kabushiki Kaisha. Printing apparatus with large number of characters. 3,881,586, Cl. 197-1.00A.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kominami, Naoya; Fukuoka, Yohei; and Sasaki, Katuyoshi, 3,882,175.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nobusawa, Tsukumo, 3,882,510.
Uno, Naoyuki; and Nomura, Katsuhiko, 3,882,523.

Asakawa, Shirow, to Matsushita Electric Industrial Co., Ltd. Stabilizing a photosensitive composition containing an N-vinyl heterocyclic compound and an organic halogen compound with an azabicycloene compound. 3,881,929, Cl. 96-48.00R.

Ashida, Hideo; Daido, Yoshimasa; Komizo, Hidemitsu; and Suzuki, Hiroyuki, to Fujitsu Limited. Linear amplifier. 3,882,411, Cl. 330-34.000.

Ashland Oil, Inc.: *See—*
Hudak, Stephen F., 3,882,189.
Robin, Michael; and Schulte, Sheldon R., 3,882,082.

Askew, Herbert Frank; Jayne, Gerald John Joseph; and Elliott, John Scotchford, to Edwin Cooper & Company Limited. Lubricant compositions. 3,882,031, Cl. 252-45.000.

Aspro-Nicholas, Limited: *See—*
Boncey, Graham Arthur; Hedge, Maurice John; and Henderson, James Rae, 3,882,228.

Associated Mills, Incorporated: *See—*
Grube, Clifford E., 3,881,471.

Astronautics Corporation of America: *See—*
Dulin, Gerald F., 3,882,367.

Ateliens de La Motobecane: *See—*
Jaulmes, Eric E., 3,881,454.

Atomic Energy of Canada Limited: *See—*
Campbell, Douglas B.; and Reeves, Edward A., 3,881,900.

Audronics, Inc.: *See—*
Heule, James E.; and Gaard, Richard C., 3,881,481.

Auge, Robert G.; and DeGrazio, Robert P., to United States of America, Energy Research and Development Administration. Silicon removal from incinerator ash by reaction with NOF.3HF. 3,882,040, Cl. 252-301.10W.

Augstein, Joachim; Carter, David; and Lee, Thomas Brian, to Fisons Limited. Chrome compounds having SRS—A properties. 3,882,148, Cl. 260-345.200.

Auld, Bertram A., to Stanford University. Parametric acoustic surface wave amplifier. 3,882,408, Cl. 330-5.500.

Auto Chem Instrument Aktiebolag: *See—*
De Leeuw, Jan, 3,881,826.

Automation Equipment, Inc.: *See—*
Swoager, Jon R., 3,881,317.

Automation Industries, Inc.: *See—*
Robertson, Thomas M., 3,882,444.

Avalon, Robert J., to Park-Ohio Industries, Inc. Water cooled grid resistor assembly for radio frequency induction heating generator. 3,882,297, Cl. 219-10.750.

Avco Corporation: *See—*
Cook, Charles W.; and Odom, James T., 3,882,465.
Straniti, Salvatore, 3,881,841.

AVM Corporation: *See—*
Anderson, Kenneth M., 3,881,793.

Aya, Masahiro; Kishino, Shigeo; Fukazawa, Nobuo; and Kume, Toyohiko, to Bayer Aktiengesellschaft. Amidothionophosphoric acid esters. 3,882,202, Cl. 260-951.000.

Ayres, Waldemar A., to Becton, Dickinson and Company. Sealed assembly for separation of blood with anti-red cell barrier. 3,882,021, Cl. 210-136.000.

Azote et Produits Chimiques, S.A.: *See—*
Lepeytre, Jean-Michel; Paul, Claude; Grandet, Louis; and Minjolle, Louis, 3,881,696.

B.V. Delft Electronics producten a Dutch: *See—*
Jonker, Wilhelm Richard, 3,882,340.

Babadzhanian, Nikolai Artemovich: *See—*
Kosyak, Jury Fedorovich; Sobolev, Sergei Petrovich; Rudkovsky, Ary Fedorovich; Ugolnikov, Viktor Vasilievich; Iglinsky, Yakov Lvovich; Babadzhanian, Nikolai Artemovich; German, Semen Iosifovich; Ochkovsky, Ivan Fedorovich; and Zilber, Teodor Markovich, 3,881,842.

Bachmann, Peter, to Ebauches Bettlach S.A. Mechanical watch movement. 3,881,312, Cl. 58-59.000.

Backlund, Sture Olof Erik, to Svenska Cellulosa Aktiebolaget. Method of producing homogeneously delignified pulp from fibrous material, containing lignocellulose, in a digester partially filled with liquor. 3,881,986, Cl. 162-19.000.

Bader, Jorg, deceased: *See—*
Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased, 3,882,103.

Bader-Ludwig, Dagmar, legal representative: *See—*
Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased, 3,882,103.

Badhwar, Ravinder K., to Dow Chemical Company, The. Chlorine recovery with aqueous hydrochloric acid. 3,881,893, Cl. 55-71.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Hagen, Helmut; Amann, August; and Giertz, Hubert, 3,882,141.
Mueller-Tamm, Heinz; Immel, Wolfgang; Mohr, Heinrich; and Fauth, Karl-Heinz, 3,882,260.

Bainbridge, Cecil: *See—*
Ellis, Peter H.; Eastham, Allen F.; Bainbridge, Cecil; and Yip, Wiley F., 3,881,609.

Baishiganov, Esengeldy: *See—*
Pomogailo, Anatoly Dmitrievich; Mambetov, Urakbai Alimbaevich; Sokolsky, Dmitry Vladimirovich; Bolshov, Alexandr Avraamovich; Gluzman, Moisei Kharitonovich; Kochurovskaya, Gerta Gennadievna; Gluzman, Evgeny Moiseevich; Matkovsky, Petr Evgenievich; Beikhold, Galina Albertovna; Afanasieva, Irina Ivanovna; Burymchenko, Mikhail Ivanovich; and Baishiganov, Esengeldy, 3,882,046.

Baker, Alvin W., to Dow Chemical Company, The. Process for stabilizing vinylidene chloride polymers against metal-induced degradation. 3,882,081, Cl. 260-45.75V.

Baker, Crispon Stuart Leworth; Barnard, Douglas; and Porter, Maurice Read, to Malaysian Rubber Producers Research Association, The. Vulcanizing natural or synthetic rubber with a diurethane decomposable to diisocyanate. 3,882,089, Cl. 260-77.5CR.

Baker Perkins Inc.: *See—*
Ingram, Charles E.; Brunk, Roy H.; and Witkoske, Edward, 3,881,403.

Balatoni, Julius A.; Khanna, Som N.; and Mills, Wayne S., to Uniroyal Ltd. Blend of thermoplastic polyurethane elastomer, polyvinyl chloride resin and chlorinated polyethylene. 3,882,191, Cl. 260-859.0PV.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 1-Substituted-3,5-dipyridyl-1,2,4-triazoles. 3,882,134, Cl. 260-296.00R.

Baldwin, Mart G.; and Reed, Samuel F., Jr., to United States of America, Army. Solid propellant with hydroxy-terminated butadiene-ferrocenyl methyl acrylate copolymer binder. 3,881,969, Cl. 149-19.200.

Ball Brothers Service Corporation: *See—*
Zappia, Anthony T., 3,881,762.

Ballew, Howard T., Sr.; Burton, Ellick E.; and Lancaster, Charles C. Electric lock assembly. 3,881,332, Cl. 70-282.000.

Bamber, Derek Robert: *See—*
Crossley, Ian Alexander; Kirk, Geoffrey Eric; Anthony, Norman Howell; and Bamber, Derek Robert, 3,882,210.

Banham, John; and Browning, Howard Edmund, to Imperial Chemical Industries Limited. Method for the production of free-flowing polytetrafluoroethylene-molding powders. 3,882,217, Cl. 264-117.000.

Bannon, Albert C., to P. R. Mallory & Co. Inc. Method of making permanent magnet rotor for a synchronous motor. 3,881,243, Cl. 29-598.000.

Banta, Edward M., to Petro-Tex Chemical Corporation. Stabilized dispersions of chloroprene polymers. 3,882,069, Cl. 260-29.7SQ.

Barannik, Ivan Andreevich; Belkin, Ivanovich; Borodin, Viktor Ivanovich; Voronova, natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Beloshudtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stephanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich. Method of producing granules of magnesium and its alloys. 3,881,913, Cl. 75-.50C.

Barlow, George J.; and Taylor, Donald R., to Honeywell Information Systems Inc. Deadtracking system. 3,882,459, Cl. 340-146.10F.

Barlucchi, Alfredo: *See—*
Montefusco, Nicola; and Barlucchi, Alfredo, 3,882,486.

Barnard, Douglas: *See—*
Baker, Crispon Stuart Leworth; Barnard, Douglas; and Porter, Maurice Read, 3,882,089.

Barnes, Eugene H.: *See—*
Hoeschele, David F., Jr.; and Barnes, Eugene H., 3,882,458.

Barnett, Eugene J., to Westinghouse Electric Corporation. Windowed door for a heat cleaning oven. 3,881,462, Cl. 126-197.000.

Barnett, Thomas A., to Monsanto Company. Square cut bias belt of steel tire cord. 3,881,237, Cl. 29-193.000.

Barnhard, Peter Robin: *See—*
McFadden, Michael Duncan; and Barnhard, Peter Robin, 3,881,499.

Barrett, Harrison H., to Raytheon Company. Spatially modulated imaging system. 3,882,310, Cl. 250-320.000.

Barry, Charles B., to Ralph M. Parsons Company. In situ recovery of hydrocarbons from tar sands. 3,881,550, Cl. 166-272.000.

Bartell, Ralph A., to Warner-Lambert Company. Container closure for lyophilized products. 3,881,626, Cl. 215-256.000.

Bartko, John: *See—*
Chu, Chang K.; Bartko, John; and Felice, Patrick E., 3,881,963.

BASF Wyandotte Corporation: *See—*
Narayan, Thirumurti L.; and Cenker, Moses, 3,882,118.

Bass, Merlyn Duane; and Gerhardt, Ralph August, to Deere & Company. Method of loading agricultural machines on a railroad car. 3,881,564, Cl. 180-21.000.

Bate, Frederick Douglas Clavell. Method and apparatus for packaging. 3,881,296, Cl. 53-30.000.

Bate, Frederick Douglas Clavell. Device for opening and filling an envelope. 3,881,299, Cl. 53-187.000.

Batorewicz, Wadim, to Uniroyal, Inc. Polymeric halogenated organophosphorus diols. 3,882,199, Cl. 260-928.000.

Battelle Memorial Institute: *See—*
Trojer, Felix J.; O'Connor, Grahame P.; and Tannenberger, Helmut, 3,881,945.

Batzer, Hans: *See—*
Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, 3,882,137.

Baudet, Jacques: *See—*
Faure, Alphonse; and Baudet, Jacques, 3,881,897.

Baugh, Benton F.: *See—*
Childers, Thomas W.; Weber, Ronald A.; Rains, John K.; and Baugh, Benton F., 3,881,516.

Baulard-Cogan, Raymond Gerard, to Agence Nationale de Valorisation de la Recherche ANVAR. Animated doll with members controlled by weighted, swiveled, slidably mounted interior rod. 3,881,275, Cl. 46-119.000.

Bauman, John H.: *See—*
Gilford, Saul R.; Freeman, Gary M.; and Bauman, John H., 3,881,827.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Antimicrobial quaternary ammonium compounds. 3,882,166, Cl. 260-479.00S.

Baumann, Heinz: *See—*
Bracher, Hans; and Baumann, Heinz, 3,881,524.

Bausch & Lomb Incorporated: *See—*
Chisholm, James J., 3,881,825.

Bayer Aktiengesellschaft: *See—*
Aya, Masahiro; Kishino, Shigeo; Fukazawa, Nobuo; and Kume, Toyohiko, 3,882,202.
Corte, Herbert; Heller, Harold; and Netz, Otto, 3,882,053.
Elghani, Salah Elabd; Fischer, Winfried; Koehler, Michael; Lindner, Johannes; and Prinz, Richard, 3,882,192.
Immel, Otto; and Schwarz, Hans-Helmut, 3,882,102.
Radlmann, Eduard; Velker, Eugen; Bentz, Francis; and Nischk, Gunther, 3,882,185.
Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, 3,882,048.

Bayless, Allan V.: *See—*
Wright, George C.; Bayless, Allan V.; and Gray, Joseph E., 3,882,111.

BBC Brown Boveri & Company Limited: *See—*
Meylan, Pierre, 3,881,843.

Bea, Gayle A., to United States of America, Navy. Pyrotechnic initiator. 3,881,419, Cl. 102-70.00R.

Beachy, Dale K.: *See—*
Botta, Jose A., Jr.; and Beachy, Dale K., 3,881,544.

Beal, Richard: *See—*
Hennessey, John D.; and Beal, Richard, 3,881,844.

Beall, George H.; Campbell, Donald E.; MacDowell, John F.; Miller, David M.; Reade, Richard F.; Rittler, Hermann L.; and Watkins, Harry J., to Corning Glass Works. Porous glass-ceramic bodies for catalyst supports. 3,881,944, Cl. 106-39.700.

Bechtold, Edwin W., to Eltra Corporation. Optical scanning system. 3,881,801, Cl. 350-6.000.

Beck, Franklin L.: *See—*
Cooley, William C.; and Beck, Franklin L., 3,881,554.

Beckman Instruments, Inc.: *See—*
Neti, Radhakrishna Murty; and Reeves, George I., 3,881,869.

Becton, Dickinson and Company: *See—*
Ayres, Waldemar A., 3,882,021.

Bedell, John R.: *See—*
Polk, Donald E.; and Bedell, John R., 3,881,542.

Bedell, John Robert, to Allied Chemical Corporation. Continuous casting of narrow filament between rotary chill surfaces. 3,881,541, Cl. 164-87.000.

Beezer, Earl F., to Stelron Cam Co. Adjustable X and Y axis controlled movement mechanism. 3,881,362, Cl. 74-53.000.

Behmel, Klaus, to Vianova-Kunsthraz, A.G. Coating compositions and process therefor. 3,882,188, Cl. 260-850.000.

Beikhold, Galina Albertovna: *See—*
Pomogailo, Anatoly Dmitrievich; Mambetov, Urakbai Alimbaevich; Sokolsky, Dmitry Vladimirovich; Bolshov, Alexandr Avraamovich; Gluzman, Moisei Kharitonovich; Kochurovskaya, Gerta Gennadievna; Gluzman, Evgeny Moiseevich; Matkovsky, Petr Evgenievich; Beikhold, Galina Albertovna; Afanasieva, Irina Ivanovna; Burymchenko, Mikhail Ivanovich; and Baishiganov, Esengeldy, 3,882,046.

Bekefi, Gabriella: *See—*
Brieger, Lajos; Doktor, Karoly; Szekely, Geza; Szenas, Tibor; Bekefi, Gabriella; and Zoranyi, Dezso, 3,881,875.

Belkin, Ivanovich: *See—*
Barannik, Ivan Andreevich; Belkin, Ivanovich; Borodin, Viktor Ivanovich; Voronova, natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Beloshudtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stephanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,881,913.

Bell, Alexis D., to Mallinckrodt, Inc. Iron enrichment of flour. 3,882,251, Cl. 426-72.000.

Bell & Howell Company: *See—*
Mueller, Arthur C., 3,882,515.

Bell, Reynold W., to Singer Co., The. Timing device with pulse splitting feedback. 3,882,404, Cl. 328-38.000.

Bell, Richard M.: *See—*
Mushovic, John N.; and Bell, Richard M., 3,881,593.

Bell, Robert Graham; Collins, James Edward; and Griffiths, Gwylfa George, to National-Standard Company Limited. Apparatus for manufacturing annular beads. 3,881,526, Cl. 140-92.200.

Bell Telephone Laboratories, Incorporated: *See—*
Feiner, Alexander; and James, Dennis Bryan, 3,882,276.
Lucas, James Allen, 3,882,390.
Schneider, Martin Victor, 3,882,396.
Schwartz, Bertram; Spitzer, Stuart Marshall; and Weigle, Gregory Dyett, 3,882,000.

Bellasio, Elvio: *See—*
Nathansohn, Giangiacomo; and Bellasio, Elvio, 3,882,119.

Bellco S.p.A.: *See—*
Cere, Sergio, 3,882,020.

Belosludtsev, Valery Sergeevich: *See—*
Barannik, Ivan Andreevich; Belkin, Ivanovich; Borodin, Viktor Ivanovich; Voronova, natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stephanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,881,913.

Belsanti, James F., to Allis-Chalmers Corporation. Aftercooler for internal combustion engine. 3,881,455, Cl. 123-119.0CD.

Ben-Tovim, Nathan. Manually held indirect ophthalmoscope especially adapted for viewing the periphery of the fundus oculi. 3,881,812, Cl. 351-6.000.

Bendix Corporation, The: *See—*
Doniger, Jerry, 3,881,670.
Harper, Peter W.; and Confair, Leslie, 3,881,453.
Helava, Uuno V., 3,881,802.
Kosakowski, Henry R.; and Washburn, Douglas J., 3,882,488.
Meyer, Helmut P., 3,882,338.

Benedetti, Riccardo; Meyer, Rudolf; Petersilka, Franz; Schittenhelm, Rudolf; Taumann, Leonhard; and Schiegl, Wolf-Eberhard, to Siemens Aktiengesellschaft. Device for X-ray treatment. 3,882,314, Cl. 250-505.000.

Benner, Robert J.; and Lundquist, Roger J., to General Motors Corporation. Fuel pick-up baffle. 3,881,457, Cl. 123-136.000.

Bennett, Raymond P.: *See—*
Jenkins, Andrew H.; Morgan, Robert L.; Bennett, Raymond P.; and Dugas, Charles E., 3,881,816.

Bennett, Walter Scott, Jr., to Burroughs Corporation. Serial transfer error detection logic. 3,882,460, Cl. 340-146.1AG.

Benninger, Siegfried; Rebsdat, Siegfried; and Kohlhaas, Rudolf, to Hoechst Aktiengesellschaft. Fluorinated tertiary amino ethers. 3,882,178, Cl. 260-563.00R.

Benninger, Siegfried; and Martini, Thomas, to Hoechst Aktiengesellschaft. Tertiary perfluoro-amino ethers. 3,882,182, Cl. 260-584.00C.

Bennington, William E. Dental floss dispenser. 3,881,502, Cl. 132-91.000.

Benson, Henry E.: *See—*
Markfelt, Reinhold S.; Paulson, Rueben E.; and Benson, Henry E., 3,881,656.

Benson, Norman E., to Electrostatic Equipment Corporation. Chuck. 3,881,763, Cl. 294-116.000.

Bentz, Francis: *See—*
Radlmann, Eduard; Velker, Eugen; Bentz, Francis; and Nischk, Gunther, 3,882,185.

Benz, Charles S., to Scott Paper Company. Method for forming apertured fibrous webs. 3,881,987, Cl. 162-116.000.

Benzing, James A., to Champion International Corporation. Gripless sheet guiding apparatus. 3,881,720, Cl. 271-63.000.

Beraudy, Philippe: *See—*
Allanic, Jacques; Beraudy, Philippe; and Guillon, Louis, 3,881,851.

Berends, Howard P., to Holland Hitch Company. Towing coupler assembly for factory made homes. 3,881,749, Cl. 280-415.00B.

Bereza, Albert: *See—*
Korner, Renzo L.; Green, David; Bereza, Albert; and Colegrove, Robert J., 3,882,262.

Berg, Alex: *See—*
May, Hans-Joachim; and Berg, Alex, 3,882,229.

Berg, David A., to Allis-Chalmers Corporation. Quick disconnect coupling. 3,881,514, Cl. 137-614.040.

Berger, Abe; and Hardman, Bruce Bertolette, to General Electric Company. Latent addition curable organopolysiloxane compositions. 3,882,083, Cl. 260-46.5UA.

Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased (by Bader-Ludwig, Dagmar, legal representative), to Ciba-Geigy Corporation. N-phosphoryl and n-phosphonyl amidines. 3,882,103, Cl. 260-240.00G.

Berkey Photo, Inc.: *See—*
Graham, Thomas G., 3,882,514.

Bernstein, Seymour: *See—*
Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, 3,882,149.

Bertolacini, Ralph J.; Hopkins, Paul Donald; and Menzl, Roland L., to Standard Oil Company. Catalyst for hydrotreating petroleum hydrocarbon oils and catalyst employed therein. 3,882,049, Cl. 252-466.0PT.

Bertolini, Natale: *See—*
Messina, Giuseppe; Lorenzoni, Loreno; and Bertolini, Natale, 3,882,183.

Bettiol, Bruno P., to Essilor International S.A. Machine for producing aspherical surfaces. 3,881,378, Cl. 82-19.000.

Beveridge, James F. Retractable basketball goal. 3,881,724, Cl. 273-1.50R.

Biderman, Benjamin B.: *See—*
Stockwell, Glade M.; and Biderman, Benjamin B., 3,882,292.

Biebuyck, Lawrence F., to Kawneer Company, Inc. Glass framing system. 3,881,287, Cl. 52-127.000.

Biebuyck, Lawrence F., to Kawneer Company, Inc. Construction element for glass framing system. 3,881,294, Cl. 52-720.000.

Biery, Galen A., Jr.: *See—*
Cotter, John L.; Melder, Robert C.; Biery, Galen A., Jr.; Rothenbuhler, Dan E.; and Rothenbuhler, Howard E., 3,881,573.

Bimba, Charles W. Fluid power cylinder with spring locking clip for threaded end cap and body cylinder. 3,881,401, Cl. 92-169.000.

Birckhead, Lennox, to Vitek Research Corporation. Powder deposition system. 3,881,653, Cl. 239-15.000.

Bird, Michael Gavin; and Parry, Keith Aled Wyn, to British Petroleum Company Limited, The. Synergistic mixture of adiamine and alkalimetalamide as an antioxidant composition and lubricants containing same. 3,882,032, Cl. 252-49.700.

Birle, John David, to General Electric Company. Abrasive boron nitride particles containing phosphorus. 3,881,890, Cl. 51-307.000.

Bissing, Donald E.: *See—*
Gash, Virgil W.; and Bissing, Donald E., 3,882,173.

Bissinger, William E., to PPG Industries, Inc. Halogenated N-substituted thiocarboxy maleimides. 3,882,145, Cl. 260-326.400.

Biviator S.A.: *See—*
Jenni, Rene; and Adler, Karl, 3,881,309.

Bixel, Charles G., Jr. Brick textured building panels and their method of manufacture and installation. 3,882,218, Cl. 264-157.000.

Black, Ian Alexander, to F. C. Robinson & Partners Limited. High voltage component testing systems. 3,882,380, Cl. 324-60.00C.

Blakeley, Clyde A.; and Morgan, Joe M., to Fabit Corporation. Process of refuse container emptying. 3,881,616, Cl. 214-152.000.

Block, Milton L.; Goldberg, David D.; and Douthit, Kenneth S. Flying toy. 3,881,729, Cl. 273-106.00D.

Block, Sheldon L. Fluid velocity responsive instrument. 3,881,354, Cl. 73-228.000.

Bluestein, Leo I.; and Meyn, John H., to GTE Laboratories Incorporated. Universal polybinary modem. 3,882,485, Cl. 340-347.0DD.

Blume, Lowell R. Monorail car and wheel assembly. 3,881,427, Cl. 105-141.000.

Board of Regents, State of Florida: *See—*
Vice, William E.; Brodersen, Arthur J.; and Lipovski, Gerald J., 3,882,274.

Boccon-Gibod, Dominique, to U.S. Philips Corporation. Semiconductor device for producing or amplifying high-frequency electromagnetic oscillations. 3,882,528, Cl. 357-3.000.

Bochory, Michael E. Fastener mechanism. 3,881,753, Cl. 285-92.000.

Bodig, Bernd: *See—*
Roozenbeek, Herman; Bodig, Bernd; Meyer, Klaus; and Fritz, Adolf, 3,881,458.

Boehringer Ingelheim G.m.b.H.: *See—*
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Bolan, Harry H.: *See—*
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Bolger, Thomas Vincent, to RCA Corporation. Doppler Correlation radar exhibiting reduced time side lobes. 3,882,493, Cl. 343-5.0PD.

Bolger, Thomas Vincent, to RCA Corporation. Doppler correlation radar providing combined target detection and ranging. 3,882,494, Cl. 343-5.0PD.

Bolger, Thomas Vincent, to RCA Corporation. Doppler correlation radar providing coarse-range detection resolution. 3,882,495, Cl. 343-5.0PD.

Bolker, James H.; Zoephel, Richard L.; and Collins, Robert F., to Kendal Company, The. Interlocked surgical drape and method. 3,881,476, Cl. 128-132.00D.

Bolshov, Alexandr Avraamovich: *See—*
Pomogailo, Anatoly Dmitrievich; Mambetov, Urakbai Alimbaevich; Sokolsky, Dmitry Vladimirovich; Bolshov, Alexandr Avraamovich; Gluzman, Moisei Kharitonovich; Kochurovskaya, Gerta Gennadievna; Gluzman, Evgeny Moiseevich; Matkovsky, Petr Evgenievich; Beikhold, Galina Albertovna; Afanasieva, Irina Ivanovna; Burymchenko, Mikhail Ivanovich; and Baishiganov, Esengeldy, 3,882,046.

Boncey, Graham Arthur; Hedge, Maurice John; and Henderson, James Rae, to Aspro-Nicholas, Limited. Analgesic formulations. 3,882,228, Cl. 424-35.000.

Bonnet, Maurice, to Agence Nationale de Valorisation de la Recherche ANVAR. Equipment for recording relief or stereoscopic images. 3,882,513, Cl. 354-115.000.

Bontinck, Walter; and De Coster, Willy, to UCB, Societe Anonyme. Method of manufacturing an artificial paper. 3,882,061, Cl. 260-23.70M.

Booker, Clyde A., Jr., to Westinghouse Electric Corporation. Hall lantern apparatus for elevator system. 3,882,447, Cl. 340-21.000.

Borden, Inc.: *See—*
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Borg-Warner Corporation: *See—*
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Borghi, Roland P.; Charpenel, Marc A.; and Taran, Jean-Pierre, to Office National d'Etudes et de Recherches Aerospatiales. Thermally pumped gasdynamic lasers. 3,882,416, Cl. 331-94.50G.

Borodin, Viktor Ivanovich: *See—*
Barannik, Ivan Andreevich; Belkin, Ivanovich; Borodin, Viktor Ivanovich; Voronova, natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stephanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,881,913.

Botta, Jose A., Jr.; and Beachy, Dale K., to Koppers Company, Inc. Mold oscillating apparatus. 3,881,544, Cl. 164-260.000.

Botzum, Richard Allen; and Koufidakis, Charalampos, to Northrop Corporation. System for determining speed and heading of airborne equipment with rectilinear coordinate positions. 3,882,501, Cl. 343-9.000.

Bouchard, Cyrille; and Bouchard, Roland. Vehicle automatic emergency signalling system. 3,882,449, Cl. 340-52.00H.

Bouchard, Roland: *See—*
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Bouchey, George J., to General Electric Company. Glazed impervious sheet assembly and method of glazing. 3,881,290, Cl. 52-398.000.

Bouchnik, Joseph. Detachable cabin aircraft. 3,881,671, Cl. 244-140.000.

Bourgeois, Alain, to Elastelle Paul Fontanille & Fils. Device for and method of making a knitted band having a spiral zipper incorporated therein. 3,881,326, Cl. 66-86.00R.

Bourner, Howard L., to Pep Industries, Inc. Combination terminal and fuse holder arrangement for an electrical circuit. 3,882,438, Cl. 337-237.000.

Bowling, Joseph E., Jr.; and Speilman, Robert A., to Carborundum Company, The. Wear plate in an apparatus for conditioning a granular material. 3,881,664, Cl. 241-275.000.

Bowman, Dennis W.; and Horn, Robert E., to United States of America, Army. RF broadband transmission line impedance matching transformer pair for less than 4 to 1 impedance transformations. 3,882,432, Cl. 333-32.000.

Bowman, Thomas C. Joint seals. 3,881,834, Cl. 404-64.000.

Boyd, Edward A.; and Harkness, Joseph R., to Briggs & Stratton Corporation. Electric motor armature core. 3,882,336, Cl. 310-216.000.

Boynton, Vaughn E. Sandbox with superstructure defining a play structure detachably attached thereto. 3,881,723, Cl. 272-1.00A.

BP Trading Limited: *See—*
Hoy, Herbert Raymond; Roberts, Alan Gregson; and Wilkins, Dennis Malcolm, 3,881,857.

Bracher, Hans; and Baumann, Heinz, to Sulzer Brothers Limited. Shuttle return apparatus. 3,881,524, Cl. 139-126.000.

Bradburne, Francis Edward Husband. Insecticidal composition employing DDVP. 3,882,226, Cl. 424-19.000.

Bradburne, Francis Edward Husband. Insecticidal composition employing DDVP. 3,882,227, Cl. 424-19.000.

Bradford, Bert C. Water treatment plant. 3,881,700, Cl. 259-4.000.

Bradley, Arthur W.; and White, Robert L., to General Motors Corporation. Adjustable steering column. 3,881,366, Cl. 74-493.000.

Bradt, Lynn J., to SI Handling Systems, Inc. Apparatus for dispensing items from shelves. 3,881,633, Cl. 221-123.000.

Brady, Thomas Eugene: *See—*
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Brainerd, Kent H.: *See—*
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Brainerd, Stuart W.: *See—*
Brainerd, Andrew W.; Brainerd, Kent H.; and Brainerd, Stuart W., 3,881,628.

Brandenburg, Jan Hendrik. Cooled shaft-furnace and stave-cooler to be used therefor. 3,881,860, Cl. 432-83.000.

Brandt, Siegfried: *See—*
Schmitt, Karl; Gude, Fritz; and Brandt, Siegfried, 3,882,085.

Braukmann, Heinz Dieter; and Hattwig, Wolfgang, to Rheinstahl Gieberei. Apparatus for casting composite cast rolls. 3,881,545, Cl. 164-349.000.

Braun, Hans: *See—*
Rasenberger, Otto; and Braun, Hans, 3,881,382.

Braun, Ralph V.: *See—*
Whitehead, Howard A.; and Braun, Ralph V., 3,881,490.

Bre Landiere S.A.: *See—*
Tilli, Lodovico, 3,881,213.

Brenig, Theodore, to General Electric Company. Control device for power line voltage measuring circuit. 3,882,373, Cl. 323-66.000.

Brenner, L. Martin; and Loev, Bernard, to SmithKline Corporation. 2-Amino(and 2-aminomethyl)-2-quinolylthioacetamides. 3,882,126, Cl. 260-283.00S.

Brieger, Lajos; Doktor, Karoly; Szekely, Geza; Szenas, Tibor; Bekefi, Gabriella; and Zoranyi, Dezso, to Tiszai Vegyi Kombinat. Equipment for the continuous production of synthetic resins for the varnish industry. 3,881,875, Cl. 23-283.000.

Briggs & Stratton Corporation: *See—*
Boyd, Edward A.; and Harkness, Joseph R., 3,882,336.

Briley, Darrell A., to Boeing Company, The. Linear microwave modulator. 3,882,425, Cl. 332-37.00D.

British Petroleum Company Limited, The: *See—*
Bird, Michael Gavin; and Parry, Keith Aled Wyn, 3,882,032.

Britt, Ronald Howard, to U.S. Philips Corporation. Character recognition apparatus. 3,882,463, Cl. 340-146.3AC.

Brittian, Ronel W.; Malarcher, Falvey L.; and Schneider, William A., to Texas Instruments Incorporated. Interactive horizon building, analysis and editing. 3,882,446, Cl. 340-15.5DS.

Brock, Carl Martin, to du Pont de Nemours, E. I., and Company. Vapor degreaser process employing trichlorotrifluoroethane and ethanol. 3,881,949, Cl. 134-31.000.

Brodersen, Arthur J.: *See—*
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Broeckx, Willy P.: *See—*
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Brokaw, Adrian Paul; and Chin, Daniel Y. S., to Wescom, Inc. Nonlinear encoder and decoder. 3,882,484, Cl. 340-347.0AD.

Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; and Neidermyer, Robert W., to Uniroyal, Inc.; and Uniroyal Ltd. Oxazole and oxadiazole benzoic acid derivatives as herbicides. 3,882,138, Cl. 260-307.00G.

Brown, Alfred, Jr.; and Schlesier, Kenneth Mansfield. Absolute value circuit employing opposite conductivity type switches. 3,882,327, Cl. 307-236.000.

Brown, Andrew M. Roll mill for flaking grain and the like. 3,881,663, Cl. 241-225.000.

Brown, Herbert C., to Aldrich-Boranes, Inc. Stabilized boranetetrahydrofuran solutions. 3,882,037, Cl. 252-188.000.

Brown, Herbert L.: *See—*
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Brown, Newton D.: *See—*
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Brown, Robert H.: *See—*
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Brown, Thomas C., to John D. Hollingsworth on Wheels, Inc. Carding machine drive. 3,881,223, Cl. 19-106.00R.

Brown & Williamson Tobacco Corporation: *See—*
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Browne Engineering Company: *See—*
Browne, Kenneth A., 3,881,637.

Browne, Kenneth A., to Browne Engineering Company. One-shot metering valve. 3,881,637, Cl. 222-136.000.

Browning, Howard Edmund: *See—*
Banham, John; and Browning, Howard Edmund, 3,882,217.

Brunato, Siro. Drillstring structure. 3,881,755, Cl. 285-137.00A.

Brunk, Roy H.: *See—*
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Bruzzese, Tiberio, to SPA - Societa Prodotti Antibiotics S.p.A. Process for preparing 4,4-disulphoxy-diphenyl-(2-pryidyl)-methane derivatives. 3,882,131, Cl. 260-294.80R.

Bryan, John F., Jr. Tie replacing system. 3,881,422, Cl. 104-9.000.

Brynda, Vaclav: *See—*
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Bryson, Robert Andrew; and Wise, James C., to Harris-Intertype Corporation. Combined newspaper press and stuffer, and method of forming newspapers therewith. 3,881,716, Cl. 270-12.000.

Buchele, Wesley F., to Iowa State University Research Foundation, Inc. Strain-gauge, brushless torque meter. 3,881,347, Cl. 73-136.00R.

Buckwalter, Geoffrey R., to Borden, Inc. Fast drying, solvent-free printing ink. 3,881,942, Cl. 106-22.000.

Budenholzer, Robert J., to Westinghouse Electric Corporation. Multi-temperature circulating water system for a steam turbine. 3,881,548, Cl. 165-110.000.

Buerger, Herbert, to Del-Met Corporation. Wheel trim locking rings. 3,881,778, Cl. 301-37.00B.

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Bullock, Greg A., to du Pont de Nemours, E. I., and Company. Fungicidal nitro organic sulfur compounds. 3,882,247, Cl. 424-337.000.

Bulso, Joseph D., Jr.: *See—*
Paumier, Thomas B.; Bulso, Joseph D., Jr.; and Lewers, William R., 3,881,436.

Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifying device for an internal combustion engine. 3,881,316, Cl. 60-302.000.

Bunjes, Johan Henri, to Neratoom B.V. Centrifugal pump for processing liquids containing abrasive constituents, more particularly, a sand pump or a waste-water pumper. 3,881,840, Cl. 415-109.000.

Burczynski, Thomas J. Bullet. 3,881,421, Cl. 102-92.200.

Burdige, Joseph: *See—*
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Burke, Edmund T.; and Kennedy, Donald F., to Electronic Associates, Inc. Code converter system and method. 3,882,483, Cl. 340-347.0DD.

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Burke, Zane L., to Hill Brothers Chemical Co., Inc. Process for effluent water recovery. 3,882,019, Cl. 210-45.000.

Burrack, Gary F.: *See—*
Burrack, Theodore W.; and Burrack, Gary F., 3,881,449.

Burrack, Theodore W.; and Burrack, Gary F. Stack feeding device. 3,881,449, Cl. 119-60.000.

Burrough, Donald E., to Gehl Company. Crop handling implement having a guide shield for cut crop material. 3,881,305, Cl. 56-257.000.

Burrough, Donald E.: *See—*
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Burroughs Corporation: *See—*
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Burton, Ellick E.: *See—*
Ballew, Howard T., Sr.; Burton, Ellick E.; and Lancaster, Charles C., 3,881,332.

Burton, Thomas A.; and Moberg, Allen W., to Waters Instruments, Inc. Method of transporting and storing organs while retaining the organs in a viable condition. 3,881,990, Cl. 195-1.700.

Bury, Linda John, administratrix: *See—*
Bury, Richard Reed, deceased; and Bury, Linda John, administratrix, 3,881,689.

Bury, Richard Reed, deceased; and Bury, Linda John, administratrix. Camper body lifting device. 3,881,689, Cl. 254-45.000.

Burymchenko, Mikhail Ivanovich: *See—*
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Butler, Lee D.: *See—*
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C. A. V. Limited: *See—*
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Cagle, Fredric William: *See—*
Kepros, John G.; Eyring, Edward; and Cagle, Fredric William, 3,882,312.

Cagle, J. Douglas, to Cagle's, Inc. Preparation of pet food from bones and animal by-products. 3,882,257, Cl. 426-274.000.

Cagle's, Inc.: *See—*
Cagle, J. Douglas, 3,882,257.

Cain, Lester L. System for monitoring the instantaneous velocity of a pipe string being tripped relative to a well bore. 3,882,474, Cl. 340-177.0CA.

Cain, Maurice Edward; Knight, Geoffrey Thomas; Lewis, Peter McHugh; and Gelling, Ian Richard, to Natural Rubber Producers' Research Association. Retardation of rubber vulcanization. 3,882,186, Cl. 260-780.000.

Caldwell, Robert M.: *See—*
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Calkins, William H.: *See—*
Cavanaugh, Robert John; and Calkins, William H., 3,882,093.

Call, Bernard J. Infinitely variable ratio gear transmission. 3,881,367, Cl. 74-681.000.

Callahan, James L.; Shaw, Wilfrid G.; and Miller, Arthur F., to Standard Oil Company. Reactivation of molybdenum containing oxidation catalysts in fluid bed reactors. 3,882,159, Cl. 260-465.300.

Camerik, Eduard; and Ong, Daniel, to U.S. Philips Corporation. Apparatus for reading a rotating disc-shaped record carrier. 3,882,317, Cl. 250-570.000.

Campbell, Donald E.: *See—*
Beall, George H.; Campbell, Donald E.; MacDowell, John F.; Miller, David M.; Reade, Richard F.; Rittler, Hermann L.; and Watkins, Harry J., 3,881,944.

Campbell, Douglas B.; and Reeves, Edward A., to Atomic Energy of Canada Limited. Gas liquid separator. 3,881,900, Cl. 55-416.000.

Campbell, Mahlon E.; and Walker, William D., to Phillips Petroleum Company. Self-lubricating bearing elements. 3,882,030, Cl. 252-12.000.

Campbell, Maxwell S. Expansion fastener. 3,881,393, Cl. 85-64.000.

Canadian Industries Limited: *See—*
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Canadian Patents and Development Limited: *See—*
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Canedo-Ramirez, Roberto. Compressible tube squeezing device. 3,881,635, Cl. 222-99.000.

Cannon, Robert: *See—*
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Cannon, Robert L., to American Optical Corporation. Synchronously reinforcing pacer. 3,881,493, Cl. 128-419.0PG.

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Carborundum Company, The: *See—*
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Carden, Edward. Ventilating device for use in anesthesiology. 3,881,479, Cl. 128-145.800.

Cardenas, Antonio Luis, to Hoover Industries, Inc. Folding chair. 3,881,770, Cl. 297-51.000.

Carella, Richard F. Arrowhead. 3,881,730, Cl. 273-106.50B.

Carle, George E., to USM Corporation. Mixing extruders. 3,881,708, Cl. 259-191.000.

Carleton, James T., to Westinghouse Electric Corporation. Apparatus and method for automatic or manual process control. 3,882,368, Cl. 318-610.000.

Carpano & Pons S.A.: *See—*
Mimeur, Robert, 3,881,655.

Carr, Peter; and Amato, Carmelo J., to Energy Development Associates. Mass flow rate control of chlorine content of electrolyte for high energy density battery. 3,881,958, Cl. 136-86.00B.

Carreira, Leonard M.; and Tulagin, Vsevolod, to Xerox Corporation. Photoelectrophoretic imaging process. 3,881,920, Cl. 96-1.0PE.

Carroll, Gordon S., to International Telephone & Telegraph Corporation. Sound communication system. 3,882,275, Cl. 179-1.00R.

Carson, Don B., to Universal Oil Products Company. Countercurrent catalytic contact of a reactant stream in a multi-stage process and the apparatus therefor. 3,882,015, Cl. 208-169.000.

Carstens, Marion R., to Georgia Tech Research Institute. Pump for use in a capsule transport pipeline. 3,881,425, Cl. 104-138.00R.

Carter, David: *See—*
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Cartwright, Peter S.: *See—*
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Cassina & Co. S. R. L.: *See—*
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Cavanaugh, Robert John; and Calkins, William H., to du Pont de Nemours, E. I., and Company. Sulfonyl-containing fluorocarbon vinyl ethers and ion exchange membrane formed therefrom. 3,882,093, Cl. 260-79.3MU.

Cenker, Moses: *See—*
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Centre National Pour l'Exploitation des Oceans: *See—*
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Ceraver: *See—*
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Cere, Sergio, to Bellco S.p.A. Concentrate diluter for preparing dialysis liquid in artificial kidneys. 3,882,020, Cl. 210-85.000.

Cerra, Anthony M.; and Kurre, Robert B., to Indian Head, Inc. Bus body. 3,881,765, Cl. 296-28.00A.

Ceska, Gary W., to Arco Polymers, Inc. Persulfate stabilized latices. 3,882,070, Cl. 260-29.70T.

Ceskoslovenska akademie ved No. 3 Narodni: *See—*
Hrabak, Frantisek; and Vacek, Milos, 3,882,169.

Cessna, Lawrence C., Jr., to Hercules Incorporated. Thermosetting compositions containing poly(arylacetylenes). 3,882,073, Cl. 260-33.6UA.

Chaffee, William H.; Rubio, Alfred M.; and Lorenz, Richard L., to Columbia Broadcasting System, Inc. Method of providing ball ends on guitar strings. 3,881,236, Cl. 29-169.500.

Chambers, Robert V.: *See*—
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Champion International Corporation: *See*—
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Champion Spark Plug Company: *See*—
Green, Sam J., 3,882,341.

Chang, Robert C. C., to Sun Oil Company of Pennsylvania. Three-coordinate fluid manifold. 3,881,513, Cl. 137-608.000.

Chapman, Philip Howard; and Hilligan, James Raymond, to Glaxo Laboratories Limited. Preparation of 7-amino cephalosporin compound. 3,882,108, Cl. 260-243.00C.

Charpenel, Marc A.: *See*—
Borghi, Roland P.; Charpenel, Marc A.; and Taran, Jean-Pierre, 3,882,416.

Chasen, Lee Richard, to Coats & Clark, Inc. Levelling device including merchandise dispensing means. 3,881,257, Cl. 33-354.000.

Chass, Jacob, to Pickering & Company, Inc. Differential transformer. 3,882,436, Cl. 336-83.000.

Chavez, Evelio F., Jr. Vehicle occupant restraint device. 3,881,745, Cl. 280-150.0SB.

Chemplex Company: *See*—
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Shida, Mitsuzo; Pullukat, Thomas J.; and Hoff, Raymond E., 3,882,096.

Chen, Hsin S., to Curtiss-Wright Corporation. Rotary expansion engine of the type having planetating rotor. 3,881,847, Cl. 418-61.00A.

Cheney, Richard F.; Port, David J.; and Spencer, James R., to GTE Sylvania Incorporated. Free flowing, sintered, refractory agglomerates. 3,881,911, Cl. 75-.5BB.

Chernick, Leon: *See*—
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Christie, Joe William. Resilient internal support for plastic pipe. 3,881,754, Cl. 285-114.000.

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Chu, Chang K.; Bartko, John; and Felice, Patrick E., to Westinghouse Electric Corporation. Irradiation for fast switching thyristors. 3,881,963, Cl. 148-1.500.

Chubb, Charles: *See*—
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Clarke, Bernard S., to Seeburn Metal Products Limited. Resiliently tiltable vehicle jack base. 3,881,692, Cl. 254-101.000.

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Clayton, Eugene Thomas; Johnston, Ruth Elinor; and Rector, James M., to Union Carbide Corporation. Cleaner compositions. 3,882,038, Cl. 252-164.000.

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Cleland, David E., to Electrohome Limited. Illuminating arrangement for channel or station selection indicator of a receiver of the standby type. 3,882,401, Cl. 325-492.000.

Clemence, Francois; and Le Martret, Odile, to Roussel Uclaf. Novel 2-alkyl-5-thiazole-carboxylic acid derivatives. 3,882,110, Cl. 260-247.10M.

Clement, Donald R.; Mason, Larry D.; and Helber, Carl A., to Motorola, Inc. Automatic melt level control for growth of semiconductor crystals. 3,882,319, Cl. 250-577.000.

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Cobaugh, Robert Franklin; and Coller, James Ray, to AMP Incorporated. Mounting means for diode matrix. 3,881,795, Cl. 339-17.00C.

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Cofer, Daniel B.; Mitchell, Francis Marion; Ward, George C.; and Kozak, Milan, to Southwire Company. Apparatus for direct cooling of continuous rolled rod. 3,881,337, Cl. 72-45.000.

Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, to Institut Francais du Petrole, des Carburants et Lubrifiants. Dicarboxylic compounds having 2,4-quinazol inedione rings. 3,882,121, Cl. 260-256.40Q.

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Colao, Angelo A., to Sanders Associates, Inc. Large field light modulator. 3,881,810, Cl. 350-285.000.

Colby, Raymond Lee. Automatically stowable towline for vehicle. 3,881,751, Cl. 280-480.000.

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Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation. Anode for electrolytic processes. 3,882,002, Cl. 204-98.000.
Cook, Herbert Carl; Farrar, Paul Alden; and Hallen, Robert Lee, to International Business Machines Corporation. Method for the formation of corrosion resistant electronic interconnections. 3,881,884, Cl. 29-590.000.
Cook, John W., to Westinghouse Electric Corp. Roll eccentricity correction system and method. 3,881,335, Cl. 72-11.000.
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CPC International Inc.: *See*—
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Crawford, Robert J., to Procter & Gamble Company, The. Insecticidal esters of 1-acenaphthenol. 3,882,242, Cl. 424-305.000.
Creek, Ellis E. Fixture for holding tube turns. 3,881,715, Cl. 269-45.000.
Cresp, Michel M., to Societe Anonyme: Poclain. Public works apparatus. 3,881,555, Cl. 173-38.000.
Cresp, Michel M., to Societe Anonyme: Poclain. Public works device comprises a body a telescopic jib. 3,881,556, Cl. 173-38.000.
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Crowell, John Arnold; and Vanover, Joel Leroy, to du Pont de Nemours, E. I., and Company. Demountable bearing and driving member for rack mounted rollers. 3,881,234, Cl. 29-115.000.
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Culbertson, Thomas L., to United States of America, Navy. Hot atmosphere particulate sampler. 3,881,359, Cl. 73-421.50A.
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De Boer, Rudolf, to Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek. Method for the preparation of a milk protein coprecipitate. 3,882,256, Cl. 426-583.000.

Debois, Pierre G. M. J.; Liekens, Albert F.; and Quaghebeur, Gilbert, to International Standard Electric Corporation. Phase locked loop transmitter. 3,882,424, Cl. 332-18.000.

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De Lang, Hendrik; and Ferguson, Eric Tapley, to U.S. Philips Corporation. Apparatus for measuring the variation of an optical path length with the aid of an interferometer. 3,881,823, Cl. 356-106.00R.

Delanty, John T.; and Hanson, William E., to International Paper Company. Disposable diaper. 3,881,488, Cl. 128-287.000.

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De Leeuw, Jan, to Auto Chem Instrument Aktiebolag. Photometer chamber unit. 3,881,826, Cl. 356-246.000.

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McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,882,044.

Delph, Bob; and Amburgey, Carl. Roll-o-wheel toy device. 3,881,277, Cl. 46-220.000.

DeLuca, Robert D., to Corning Glass Works. Apparatus for treating glass optical waveguide fibers. 3,881,902, Cl. 65-12.000.

Demaline, Donald R. Convertible and collapsible backpack. 3,881,644, Cl. 224-25.00A.

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DePedro, Donald; and Cannon, Robert, to American Optical Corporation. Electrocardiographic telemetry and telephone transmission link system. 3,882,277, Cl. 179-2.0DP.

Depree, David O., to Aerojet-General Corporation. Process for recovery of minerals from acidic streams. 3,882,018, Cl. 210-20.000.

Derby, Robert L., to Dow Chemical Company, The. Disposal system. 3,881,295, Cl. 53-21.00R.

Derbyshire, George C., to Jacobs Manufacturing Company, Limited, The. Drill attachment. 3,881,838, Cl. 408-67.000.

Dereszynski, Timothy B. Quick-mount caps. 3,881,391, Cl. 85-55.000.

Deschamps, Andre; Dezael, Claude; Franckowiack, Sigismond; and Renault, Philippe, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process for purifying a gas containing oxygenated sulfur compounds and recovering sulfur using ammonia liquors. 3,882,222, Cl. 423-575.000.

Deskevich, Stephen; Peacock, James C.; Tynan, Richard F.; and Wilson, Alan D., to International Business Machines Corporation. Anti-holdover charging circuit for flash lamp. 3,882,358, Cl. 315-241.00P.

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Deve, Vagn, to Combustion Engineering, Inc. Conveyor system for the intermittent forwarding of sand molds. 3,881,595, Cl. 198-219.000.

DeWeese, John L., to Westinghouse Electric Corporation. Fail safe linear motion device. 3,882,333, Cl. 310-14.000.

De Witt, David, to International Business Machines Corp. Flat screen display device using controlled cold cathodes. 3,882,355, Cl. 315-169.0TV.

Dexion-Comino International Limited: *See—*
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Dickinson, Thomas; and Greenley, Lynden John, to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom and Northern Ireland, The. Oxygen sensors. 3,882,012, Cl. 204-195.00P.

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Digital Equipment Corporation: *See—*
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Dilworth, John Lewis; and Zimmerer, John Louis, to McCulloch Corporation. Method and apparatus for operating an engine-driven chain saw in an environment where ice may form in the carburetor of the engine. 3,881,452, Cl. 123-1.00A.

Dilworth, Thomas E., Jr., to United States of America, Army. Choked flechette weapon system. 3,881,416, Cl. 102-63.000.

DiSabatino, Sabatino. Incinerator. 3,881,431, Cl. 110-8.00C.

Di Settembrini, Antoine. Process for the preparation of polyvinyl chloride moulding compositions. 3,882,074, Cl. 260-34.200.

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Dohler, Gottfried Heinrich, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Semiconductor device. 3,882,533, Cl. 357-58.000.

Dohmori, Renzo; Kadoya, Shizuo; Nagasaki, Senkichi; and Ogawa, Hidemasa, to Daiichi Seiyaku Co., Ltd. 2,9-Dioxo-3,6 substituted thiazolo[5,4-f] quinoline-8-carboxylates. 3,882,125, Cl. 260-283.00S.

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Du Bois, Jean P.; and Rieckman, Roger A., to Sunbeam Corporation. Stairholding device for vacuum cleaner. 3,881,535, Cl. 15-327.00E.

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Fooladi, Mike Mehdi. Catalyst composition and production of 2,2-dichloropropionic acid therewith. 3,882,045, Cl. 252-429.00R.

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Fougea, Edouard Marie, to Constructions Edmond Coignet. Plant for the fabrication of parallel molded construction elements. 3,881,856, Cl. 425-432.000.

Fowells, Robert W.; Damon, Robert A.; and Coma, James G., to Crown Zellerbach Corporation. Process for forming polyolefin fibers. 3,882,095, Cl. 260-88.20R.

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French, Bruce K. Wide-angle rear view mirror with rotary center piece. 3,881,811, Cl. 350-289.000.

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Gardner, Elmer W. Tightening spindle for mobile homes. 3,881,694, Cl. 254-164.000.

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Hostettler, Fritz, to IPRC Corporation. Method for manufacturing flexible, vapor-permeable, hydrolysis-stable polyurethane elastomers and the products produced therefrom. 3,882,054, Cl. 260-2.5AY.

Hoy, Herbert Raymond; Roberts, Alan Gregson; and Wilkins, Dennis Malcolm, to BP Trading Limited. Combustor. 3,881,857, Cl. 431-7.000.

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Hoyt, John M.; Koch, Karl; and Williams, Mathew, Jr., to National Distillers and Chemical Corporation. Process for preventing discoloration in hydrolyzed ethylene-vinyl acetate copolymers by exposure to radiation. 3,882,005, Cl. 204-159.140.

Hrabak, Frantisek; and Vacek, Milos, to Ceskoslovenska akademie ved No. 3 Narodni. 1,2,2,2,-Tetrachlorethyl acrylate and methacrylate. 3,882,169, Cl. 260-486.00H.

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Hudak, Stephen F., to Ashland Oil, Inc. Polyester resins prepared from organic polyisocyanates and blends with other resins or monomers. 3,882,189, Cl. 260-850.000.

Huf, Franz, to Dornier System GmbH. Packing strip arrangement for highly superheated gases in engines and other working machines. 3,881,848, Cl. 418-123.000.

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Hults, Harold W., to Cutler-Hammer, Inc. Tool handle switch with interlock. 3,882,294, Cl. 200-157.000.

Hunkeler, Ernst J., to Gleason Works, The. Method for resharpening cutting blades and cutter. 3,881,889, Cl. 51-288.000.

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Hunter, John C., to Honeywell Information Systems Inc. Multiple register variably addressable semiconductor mass memory. 3,882,470, Cl. 340-173.00R.

Hupkes, Leonard, to Conrad Starke B.V. Bridge crane. 3,881,608, Cl. 214-14.000.

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Jenni, Rene; and Adler, Karl, to Biviator S.A. Electronic timepiece. 3,881,309, Cl. 58-23.00V.

Jensen, Dale J., to Digital Equipment Corporation. Circuit for transmitting velocity signals derived from position signals. 3,882,402, Cl. 328-13.000.

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Johannsen, Hans Werner. Photographic apparatus. 3,882,521, Cl. 354-79.000.

Johansen, Hans A.; and Russell, David D., to Samuel Moore & Company. Dimensionally stable, flexible hydraulic hose having improved chemical and temperature resistance. 3,881,521, Cl. 138-126.000.

Johansson, Dag Valdemar Henry. Method and apparatus for lifting loads step-by-step, especially heavy loads. 3,881,687, Cl. 254-1.000.

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Johnson, Bruce A.; and Webster, Marvin D. Wheeled snowmobile storage pallet. 3,881,740, Cl. 280-79.100.

Johnson, Dennis C.; and Davenport, Ronald J., to Iowa State University Research Foundation, Inc. Method for voltammetric determination of nitrate and nitrite. 3,881,997, Cl. 204-1.00T.

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Johnson, Lowell, to Transco Inc. Insulated conduit cover and leak detector. 3,882,382, Cl. 324-65.00R.

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Jones, Allen, Jr. Semi-displacement hydrofoil ship. 3,881,438, Cl. 114-66.50H.

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Jones, Paul, Jr.; and Jones, Ferris E. Loading dock. 3,881,207, Cl. 14-72.000.

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Joseph Lucas (Industries) Limited: *See—*
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Joubert, Philippe, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for measuring the rate of penetration of the drill bit during drilling operations performed from a floating installation. 3,881,695, Cl. 254-172.000.

Jouppi, Eino J. Separable blade cradle device for delimbing trees. 3,881,532, Cl. 144-2.00Z.

Joy Manufacturing Company: *See—*
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Joyce, T. Bob, to Hickory Springs Manufacturing Company. Rocker spring unit. 3,881,713, Cl. 267-131.000.

Junek, Jan: *See*—
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Jupko, Lev Dmitrievich. Blast-furnace tuyere. 3,881,710, Cl. 266-41.000.

Jurado, Rodrigo. Measuring dispensing device. 3,881,360, Cl. 73-425.600.

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Kader, John F. Trolling attachment for a propeller. 3,881,441, Cl. 114-145.00A.

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Kalwaites, Frank, to Johnson & Johnson. Apparatus for producing reticulate sheet material. 3,881,381, Cl. 83-170.000.

Kamegaya, Takeo; Imahori, Yutaka; Kaneko, Ryuichi; and Yokozawa, Minori, to Nippon Hoso Kyokai. Gas discharge display panel for color picture reproduction. 3,882,342, Cl. 313-188.000.

Kamp, Ewald A., to Union Carbide Corporation. Method for the high speed production of non-woven fabrics. 3,882,211, Cl. 264-91.000.

Kamp, Leonard F.; and Koval, Edward J., to Eastman Kodak Company. Focusing device for camera having selectable focal lengths. 3,882,520, Cl. 354-197.000.

Kanda, Yukio, to Okuma Seisakusho Co., Ltd. Interlocking units having meshed gears and drive means for a movable toy thereon. 3,881,274, Cl. 46-16.000.

Kaneko, Ryuichi: *See*—
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Kaneko, Yasuhisa: *See*—
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Kanemitsu, Seizo. Muscle relaxing apparatus. 3,881,469, Cl. 128-25.00R.

Kang, Chi Lung, to General Electric Company. Means for detecting corona within high-voltage electrical apparatus. 3,882,379, Cl. 324-54.000.

Kangol-Teka, Sicherheitsgurt GmbH: *See*—
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Kardashian, Vahram S.: *See*—
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Karlsson, Jan Anders Rolf. Means in welding tools for welding with welding electrodes and means for smoke removal. 3,882,300, Cl. 219-130.000.

Karpowycz, Oleh; and Klymkiw, Walter, to Zenith Radio Corporation. Radio or television receiver tuning indicator. 3,882,399, Cl. 325-455.000.

Kashirin, Alexei Petrovich: *See*—
Ryabinin, Vladimir Alexandrovich; Sadofiev, Vladimir Ivanovich; Mitin, Igor Mikhailovich; Yankevich, Kira Boleslavovna; Matrosov, Evgeny Ivanovich; Leliovsky, Anton Felixovich; Terra, Karl Romanovich; and Kashirin, Alexei Petrovich, 3,882,351.

Kashmerick, Gerald E., to Outboard Marine Corporation. Fluid pump with resilient pumping membrane. 3,881,846, Cl. 417-478.000.

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Katagiri, Kotaro; Saito, Masayuki; Saito, Jiro; Nishibayashi, Kiyoshige; and Matsuo, Tatsuyuki, to Shinetsu Chemical Company; and Ohbayashi-Gumi, Ltd. Apparatus for driving board drains underground. 3,881,319, Cl. 61-11.000.

Kato, Katsumi; and Sato, Naoaki, to Takiron Co., Ltd. Combination pipe joint structure. 3,881,830, Cl. 403-171.000.

Katsobashvili, Yakov Rafailovich; and Serenko, Anatoly Sergeevich. Method of producing highly aromatized low-sulphur hydrocarbon petroleum stock. 3,882,013, Cl. 208-60.000.

Katsube, Yujiro: *See*—
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Katsuhara, Yasuo: *See*—
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Katsuyama, Harumi; and Ono, Histake, to Fuji Photo Film Co., Ltd. 1'-Oxospiro(indoline-2,3'-1'H,3H'-2-benzoxepine)derivatives and process for the preparation thereof. 3,882,144, Cl. 260-326.11S.

Katz, Howard M., to Phillips Petroleum Company. Two-stage incinerator. 3,881,430, Cl. 110-8.00F.

Kaufman, Harry, to O.K. Machine and Tool Corporation. Wire cut and strip tools. 3,881,248, Cl. 30-90.100.

Kaulins, Edward, to Timex Corporation. Battery discharge guard for electric watch. 3,881,313, Cl. 58-105.000.

Kavesh, Sheldon, to Allied Chemical Corporation. Method of forming metallic filament cast on interior surface of inclined annular quench roll. 3,881,540, Cl. 164-87.000.

Kawakami, Fukushi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with effect control dependent on expression and keyboard manipulation. 3,881,387, Cl. 84-1.240.

Kawakami, Hiromi: *See*—
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Kawano, Shigeyoshi: *See*—
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Biebuyck, Lawrence F., 3,881,294.

Kazek, Gregory J.; and Speros, Dimitrios M., to General Electric Company. Metal halide discharge lamp containing tin and sodium halides. 3,882,345, Cl. 313-229.000.

Kearney & Treaker,Corporation: *See*—
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Keerdoja, Juri. Combined suitcase and hanging bag. 3,881,579, Cl. 190-44.000.

Kelly, Calvin E., to Unjted States Steel Corporation. Method of printing and dispensing labels. 3,881,979, Cl. 156-249.000.

Kelly, Edward A., to Merrow Machine Company, The. Overedge sewing machine construction. 3,881,434, Cl. 112-162.000.

Kelly, Robert R., to Borg-Warner Corporation. Pipe tong positioning system. 3,881,375, Cl. 81-57.350.

Kelly, Robert R., to Borg-Warner Corporation. Apparatus for sensing anomalies at the threaded pipe joints of a pipe string using a double telescoping probe. 3,882,377, Cl. 324-37.000.

Kelsey-Hayes Company: *See*—
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Kennecott Copper Corporation: *See*—
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Kepros, John G.; Eyring, Edward; and Cagle, Fredric William, to University of Utah. X-ray lasers. 3,882,312, Cl. 250-493.000.

Kernohan, John A., to General Electric Company. Alkali metal polytungstate phosphors containing europium. 3,881,941, Cl. 106-20.000.

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Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, to Merck Patent Gesellschaft mit beschrankter Haftung. 3-(5-Oxyphenethyl)-glutarimides. 3,882,124, Cl. 260-281.000.
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Kopp, Georg, to Sig Schweizerische Industrie-Gesellschaft. Apparatus for the groupwise packaging of bags. 3,881,645, Cl. 225-94.000.
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Korner, Renzo L.; and Green, David, to Westinghouse Electric Corporation. Electrical penetration for withstanding voltage surge on the conductor. 3,882,263, Cl. 174-11.00R.
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Kosarev, Sergei Petrovich; Didrikh, Nina Voldemarovna; Yazev, Vladimir Dmitrievich; Raskatov, Viktor Georgievich; Romanenko, Oleg Nikolaevich; and Trukhin, Alexandr Fedorovich. Electric furnace and method for the continuous refining of magnesium. 3,882,261, Cl. 13-23.000.

Kosicki, Witold W.; and Hollingsworth, Charles M., to Horsman Dolls Inc. Doll including a joint member with filling opening and gas vent therein. 3,881,276, Cl. 46-162.000.

Koster, Charles A.; and Perry, Wayne E., to Aero Electronics Development Co., Inc. Airplane crash locating device. 3,882,394, Cl. 325-115.000.

Kosyak, Jury Fedorovich; Sobolev, Sergei Petrovich; Rudkovsky, Ary Fedorovich; Ugolnikov, Viktor Vasilievich; Iglinsky, Yakov Lvovich; Babadzhanian, Nikolai Artemovich; German, Semen Iosifovich; Ochkovsky, Ivan Fedorovich; and Zilber, Teodor Markovich. Diaphragm for steam turbine stage. 3,881,842, Cl. 415-168.000.

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Krezanoski, Joseph Z.; and Petricciani, John C., to Flow Pharmaceuticals, Inc. Contact lens cleaning and storing composition including nonionic surfactant, benzalkonium chloride and Na_2EDTA. 3,882,036, Cl. 252-106.000.

Krier, Keith N.; and Kimzey, Paul W., to Tennant Company. Surface cleaning apparatus. 3,881,215, Cl. 15-340.000.

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Krings, Josef. Pressure guide for use in ditch supporting assembly. 3,881,679, Cl. 248-356.000.

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Kruggel, Robert Henry, to International Business Machines Corporation. Differential amplifier for sensing small signals. 3,882,326, Cl. 307-235.00R.

Krulwich, Lester S. Device for re-inking typewriter ribbons. 3,881,588, Cl. 197-171.000.

Krzewinski, Henrietta K., to Johnson & Johnson. Reinforced surgical drape. 3,881,474, Cl. 128-132.00D.

Kubota, Hideo, to General Motors Corporation. Fiber reinforced polyester resin having a low surface profile and improved impact strength. 3,882,078, Cl. 260-40.00R.

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Kurimoto, Masashi; and Sugimoto, Kaname, to Hayashibara Company. Process for producing amylose powders having a mean degree of polymerization between 20–30. 3,881,991, Cl. 195-31.00R.

Kurita, Takaji; and Fujiwara, Takao, to Minolta Camera Kabushiki Kaisha. Magnetic brush developing apparatus. 3,881,446, Cl. 118-637.000.

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Lafourcade, Jean-Michel. Breathing aid apparatus. 3,881,480, Cl. 128-145.800.

Lagoutte, Pierre. Apparatus for the permutation of movable bed fluids. 3,882,022, Cl. 210-189.000.

L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des procedes George Claude: *See*—
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Lambert, Robert D., to Multiply Development Corporation Ltd. Method of felting fibrous elements. 3,881,225, Cl. 19-155.000.

Lancaster, Charles C.: *See*—
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Land, Edwin H.; and Morse, John B., to Polaroid Corporation. System for mounting photographic accessories on a camera. 3,882,517, Cl. 354-295.000.

Landen, William James. Safety closure device. 3,881,623, Cl. 215-216.000.

Landen, William James. Ratchet-type safety closure. 3,881,625, Cl. 215-221.000.

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Larkfeldt, Birger, to Aktiebolaget Svenska Flaktfabriken. Distributing ventilating medium within spaces. 3,881,402, Cl. 98-40.00N.

Larkin, Terrance M., to Gates Rubber Company, The. Battery paste pumping and metering system. 3,881,654, Cl. 239-127.000.

Larson, John D., III, to Hewlett-Packard Company. Acoustic terminations for acoustically tuned optical filters. 3,881,805, Cl. 350-149.000.

Laune, Pierre, to Unilando. Child's collapsible stroller. 3,881,739, Cl. 280-42.000.

LaVange, Donald H., to Polytop Corporation. Child resistant closures with lever opening. 3,881,643, Cl. 222-505.000.

Lavering, Gordon R., to Varian Associates. Heat transfer device employing fins in a fluid stream. 3,881,547, Cl. 165-80.000.

Lavnikanis, Vladimir Fedorovich: *See*—
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Lavoie, Rene L. Small vehicle snow plow. 3,881,261, Cl. 37-46.000.

Lawrence, Franklin B.; and Lewis, Robert E., to Timelapse, Inc. Camera system with on-frame digital recording means. 3,882,512, Cl. 354-109.000.

Lawrence Peska Associates, Inc.: *See*—
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Layne, Melvin E. Panel mold for forming composite concrete-reinforced walls. 3,881,291, Cl. 52-426.000.

Le Nickel: *See*—
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Le Brasseur, Genevieve, nee Nicoud; and Nicco, Adrien, to Ethylene Plastique. Photodegradable polymeric compositions containing a mixture of an iron salt and sulfur or a dialkyl polysulfide. 3,882,058, Cl. 260-23.00H.

LeBus International, Inc.: *See*—
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Le Diouron, Raymond, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des procedes George Claude. Method of cooling products. 3,881,322, Cl. 62-63.000.

Lee, George Timothy, to Edgewood Surgical Company, Inc. Splint for the leg of a dog or cat. 3,881,472, Cl. 128-89.00R.

Lee, Kwan-Hua, to University of California, The Regents of the. Method of treating acne with a c_{20} acid. 3,882,244, Cl. 424-318.000.

Lee, Thomas Brian: *See*—
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Leedom, Marvin Allan, to RCA Corporation. Rotary stylus cleaner. 3,881,734, Cl. 274-1.00R.

Leedom, Marvin Allan, to RCA Corporation. Video playback system tracking arm and pickup assembly. 3,882,267, Cl. 178-6.60A.

Leenders, Johannes Petrus; and Rutjes, Peter Caspar Stephanus, to U.S. Philips Corporation. Non-reciprocal field displacement isolator. 3,882,428, Cl. 333-24.200.

Leger, Andre: *See*—
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Leloux, Arnoldus Willem Jan, to Wavin B.V. Device for producing roll-shaped packets of bags of plastic. 3,881,665, Cl. 242-67.30R.

Lemaitre, Jean-Claude, to Paulstra. Elastic supports. 3,881,711, Cl. 267-57.10R.

Le Martret, Odile: *See*—
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LeMon, David E. Radioactive gas inhalator. 3,881,463, Cl. 128-2.00A.

Lempke, Leslie C., to Homelawn Corporation. Dumpable grass catcher. 3,881,304, Cl. 56-202.000.

Leonard, Gordon Harris, to C. A. V. Limited. Vehicle electrical systems. 3,882,321, Cl. 307-10.0LS.

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L'Eplattenier, Francois; and Pugin, Andre, to Ciba-Geigy Corporation. Phenyl-azo-(polycyclic)heterocyclic metal complexes. 3,882,099, Cl. 260-146.00R.

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Levene, Max Moses. Sampling device and method. 3,881,464, Cl. 128-2.00B.

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Mani, Inder, to Dow Chemical Company, The. Vinyl ester resin and process for curing same with ionizing radiation in the presence of amines. 3,882,004, Cl. 204-159.160.
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McGuigan, Brian; Dellar, Richard John; and Phillips, William David, to Ciba-Geigy Corporation. Antioxidant composition of a rearrangement product of a tetra-aryl hydrazine and a thiazine or amine. 3,882,043, Cl. 252-402.000.
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McMurray, William, to General Electric Company. Control of power converters having a parallel resonant commutation circuit. 3,882,370, Cl. 321-45.00R.
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Mule, Carmela. Vehicle movement sensitive alarm. 3,882,453, Cl. 340-65.000.

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Naples, Richard J.; and Newhall, Norman H., to General Signal Corporation. Quick break type switch with snap action deactuation structure. 3,882,293, Cl. 200-154.000.

Narayan, Thirumurti L.; and Cenker, Moses, to BASF Wyandotte Corporation. Process for the preparation of unsymmetrically-substituted alkanolamino-s-triazines. 3,882,118, Cl. 260-249.600.

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Nieuweboer, Gerrit; and Apostolico, Martin A., to du Pont de Nemours, E. I., and Company. Battery operated electroluminescent film identification device. 3,882,357, Cl. 315-209.00R.

Nihon Denshi Kabushiki Kaisha: *See*—
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Niina, Akihiko; Qura, Kiyomori; and Tashiro, Kuniyoshi, 3,882,047.

Nippondenso Co., Ltd.: *See—*
Hase, Masaru; Ishihara, Shinya; Maki, Mikio; and Mizuno, Kiyohiko, 3,881,685.
Tashiro, Hiroyuki; and Urano, Susumu, 3,882,490.

Nischk, Gunther: *See—*
Radlmann, Eduard; Velker, Eugen; Bentz, Francis; and Nischk, Gunther, 3,882,185.

Nishibayashi, Kiyoshige: *See—*
Katagiri, Kotaro; Saito, Masayuki; Saito, Jiro; Nishibayashi, Kiyoshige; and Matsuo, Tatsuyuki, 3,881,319.

Nishida, Toyomi; Sohma, Hiroshi; and Ito, Hayami, to Kawasaki Jukogyo K.K. Apparatus for calcination of cement-clinker. 3,881,862, Cl. 432-106.000.

Nishimura, Izuhiko: *See—*
Hama, Tetsuro; and Nishimura, Izuhiko, 3,881,311.

Nishimura, Taiichi: *See—*
Tsubota, Motohiko; Nishimura, Taiichi; and Ohkubo, Kinji, 3,881,931.

Nishioki Mfg. Co., Ltd.: *See—*
Sato, Toshio. 3,881,204.

Nissan Jidosha Kabushiki Kaisha: *See—*
Miyauchi, Toshiyuki; and Ohtsuka, Kunio, 3,881,372.

Nissan Motor Company Limited: *See—*
Fujishiro, Takeshi; Masaki, Kenji; and Wazawa, Kiyoshi, 3,882,451.

Nitzsche, Erhard; Zirnstein, Peter; Schebiella, Erwin; Korner, Siegfried; Weise, Joachim; Schlaugat, Horst; and Richter, Wolfgang, to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Sheet transporting unit for use in printing machines or the like. 3,881,646, Cl. 225-96.000.

Niwa, Tatuo, to Kabushiki Kaisha Aichi Denki Kosakusho. Electrically powered can opener. 3,881,247, Cl. 30-4.00R.

Nix, Edwin Lee. Pickup truck bed liner and protector. 3,881,768, Cl. 296-39.00R.

Noble, Terrance O. Apparatus for measuring liquid in the reconstitution of antibiotics. 3,881,640, Cl. 222-158.000.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Oscillation systems for control of camera shutters. 3,882,510, Cl. 354-24.000.

Noda, Fumiyoshi: *See—*
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 3,881,316.

Noda, Touru; and Kobayashi, Norio, to Mitsubishi Paper Mills, Ltd. Photographic silver halide emulsions containing sydnones or sydnone imines as stabilizers. 3,881,939, Cl. 96-109.000.

Noel y Compania Limitada Sociedad Anonima Argentina de Dulces y Conservas: *See—*
Abalo, Juan Manuel, 3,881,591.

Nohara, Shigezo; Hirata, Shunsaku; Yazaki, Jinichi; and Suzuki, Toru, to Toyo Seikan Kaisha Ltd. Laminate of ethylene/vinyl alcohol copolymer, ethylene/vinyl acetate copolymer and polyolefins. 3,882,259, Cl. 428-35.000.

Nohira, Hidetaka; and Kobashi, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system. 3,881,456, Cl. 123-119.00A.

Nomura, Katsuhiko: *See—*
Uno, Naoyuki; and Nomura, Katsuhiko, 3,882,523.

Noordermeer, Williem Hadde: *See—*
Vredenbregt, Jakob; Noordermeer, Williem Hadde; and Westoff, Jacobus Martinus, 3,881,496.

Nordmark-Werke GmbH: *See—*
May, Hans-Joachim; and Berg, Alex, 3,882,229.

Norian, Roger F., to Xerox Corporation. Carrier detector. 3,882,272, Cl. 178-7.30R.

Norris, Darrell E.: *See—*
Allen, Marshall T.; and Norris, Darrell E., 3,881,460.

North Electric Company: *See—*
Apple, Garrett Gordon, Jr., 3,882,412.

Northrop Corporation: *See—*
Botzum, Richard Allen; and Koufidakis, Charalampos, 3,882,501.

Northup, Marcus Allen, Jr.: *See—*
Schoenholz, Daniel; Petersen, Arthur W.; and Northup, Marcus Allen, Jr., 3,881,948.

Norton Company: *See—*
Hauck, Eldon W., 3,881,845.
Mushovic, John N.; and Bell, Richard M., 3,881,593.
Watson, George R., 3,881,282.

Norwood Marking & Equipment Company: *See—*
Shenoha, James L., 3,881,410.

Nosker, Richard William; and Fox, Leonard Pincus, to RCA Corporation. Trapezoidal smooth grooves for video disc. 3,882,214, Cl. 264-106.000.

Nosley, Jacques Andre, to Societe Ben. Electromagnetic sensor for measuring velocity of fluids under high pressure. 3,881,350, Cl. 73-194.0EM.

Nothiger, Otto, to Ciba-Geigy Corporation. Apparatus for sequentially evacuating and impregnating a textile web. 3,881,445, Cl. 118-4.000.

Novello, Frederick C.: *See—*
Baldwin, John J.; and Novello, Frederick C., 3,882,134.

Novosel, Thomas A.; and Erskine, Donald O., to Vermont American Corporation. High speed steel metal cutting tool with integral working surfaces substantially free of carbide particles. 3,881,837, Cl. 408-144.000.

Nunley, James A.; and Agnew, Jeremy A., to Vicon Instrument Company, The. Implantable hearing aid and method of improving hearing. 3,882,285, Cl. 179-107.00E.

Nusbaum, Arthur. Elevating perimeter railing. 3,881,699, Cl. 256-59.000.

Nuttall, Roy; and Dormer, Leslie, to Ferranti Limited. Methods of manufacturing semiconductor devices. 3,881,242, Cl. 29-589.000.

Nystuen, David L.: *See—*
Kleimola, David L.; Nystuen, Marcus I.; and Nystuen, David L., 3,881,328.

Nystuen, Marcus I.: *See—*
Kleimola, David L.; Nystuen, Marcus I.; and Nystuen, David L., 3,881,328.

Nyunoya, Mizuo, to Aisin Seiki Kabushiki Kaisha. Brake hydraulic pressure control system for vehicles. 3,881,780, Cl. 303-21.00F.

O.K. Machine and Tool Corporation: *See—*
Kaufman, Harry, 3,881,248.

Oak Industries, Inc.: *See—*
Harney, Ralph P., 3,882,392.
Walding, Eugene C., 3,882,266.
Walding, Eugene C.; and Cummings, John G., 3,882,289.

Ochkovsky, Ivan Fedorovich: *See—*
Kosyak, Jury Fedorovich; Sobolev, Sergei Petrovich; Rudkovsky, Ary Fedorovich; Ugolnikov, Viktor Vasilievich; Iglinsky, Yakov Lvovich; Babadzhanian, Nikolai Artemovich; German, Semen Iosifovich; Ochkovsky, Ivan Fedorovich; and Zilber, Teodor Markovich, 3,881,842.

O'Connor, Grahame P.: *See—*
Trojer, Felix J.; O'Connor, Grahame P.; and Tannenberger, Helmut, 3,881,945.

Odello, Robert J.: *See—*
Allgood, Jay R.; and Odello, Robert J., 3,881,559.

Odom, James T.: *See—*
Cook, Charles W.; and Odom, James T., 3,882,465.

Office National d'Etudes et de Recherches Aerospatiales: *See—*
Borghi, Roland P.; Charpenel, Marc A.; and Taran, Jean-Pierre, 3,882,416.

Ogawa, Hidemasa: *See—*
Dohmori, Renzo; Kadoya, Shizuo; Nagasaki, Senkichi; and Ogawa, Hidemasa, 3,882,125.

Ogawa, Mutsuo, to Ricoh Co., Ltd. Image transmission system. 3,882,270, Cl. 178-7.100.

Ogawa, Yukio; and Miki, Haruo. Apparatus for surveying paved surface. 3,882,268, Cl. 178-6.000.

Ogiso, Mitsutoshi; Aizawa, Hiroshi; and Iwashita, Tomonori, to Canon Kabushiki Kaisha. Automatic wind-up device to detect completion of film wind-up. 3,882,516, Cl. 354-173.000.

Ogita, Minoru; and Matsui, Teruyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Receiving frequency indicator system for broadcast receiver. 3,882,398, Cl. 325-455.000.

Ogle, James A.: *See—*
Holz, George E.; and Ogle, James A., 3,882,349.

Ohbayashi-Gumi, Ltd.: *See—*
Katagiri, Kotaro; Saito, Masayuki; Saito, Jiro; Nishibayashi, Kiyoshige; and Matsuo, Tatsuyuki, 3,881,319.

Ohkawa, Nobuyoshi, to Daieigiken, Inc. Dough processing device. 3,881,404, Cl. 99-353.000.

Ohkubo, Kinji: *See—*
Masuda, Takao; Ohkubo, Kinji; Sugiyama, Mitsunori; and Shishido, Tadao, 3,881,938.
Tsubota, Motohiko; Nishimura, Taiichi; and Ohkubo, Kinji, 3,881,931.

Ohlidal, Vladimir: *See—*
Marsalek, Milan; Brynda, Vaclav; Junek, Jan; Hortlik, Frantisek; Ripka, Josef; Vobornik, Vaclav; and Ohlidal, Vladimir, 3,881,308.

Ohlschlager, Hans; Riester, Oskar; Ghys, Theofiel Hubert; Verhille, Karel Eugeen; and Vanheertum, Johannes Josephus, to Agfa-Gevaert Aktiengesellschaft. Sensitized electrophotographic layers with a polymethine sentizing dye. 3,881,926, Cl. 96-1.600.

Ohorodnik, Alexander: *See—*
Lohmar, Elmar; Ohorodnik, Alexander; Gehrmann, Klaus; and Stutzke, Paul, 3,882,167.

Ohtsuka, Kunio: *See—*
Miyauchi, Toshiyuki; and Ohtsuka, Kunio, 3,881,372.

Okabe, Katsuhiko, to Kabushiki Kaisha Koparu. Device for controlling the movement of the printing head in printers. 3,881,587, Cl. 197-1.00R.

Okuma Seisakusho Co., Ltd.: *See—*
Kanda, Yukio, 3,881,274.

Olcott, Herbert K. Bite indicating device. 3,881,270, Cl. 43-17.000.

Olin Corporation: *See—*
Raynor, Robert J.; and Petroskey, Wade T., 3,882,052.

Olson, Harold G., to H. G. Olson & Company, Incorporated. Method for making weatherstripping having a foam plastic core, a tough outer skin, and a sealing surface covered with flocked fibers or the like. 3,881,980, Cl. 156-268.000.

Olson, Michael L. Marking disc for pool games. 3,881,727, Cl. 273-14.000.

Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Rapid setting non-elastomeric polyurethane compositions prepared in the presence of an organic phosphate, phosphite or phosphonate. 3,882,071, Cl. 260-30.60R.

Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Rapid setting non-elastomeric polyurethane compositions prepared in the presence of non-hydroxyl containing polyoxyalkylene compounds. 3,882,072, Cl. 260-33.20R.

Olympia Werke AG: *See—*
Thevis, Paul, 3,881,412.

Olympus Optical Company Limited: *See—*
Ikeda, Yoshitsugu, 3,881,804.

Ong, Daniel: *See—*
Camerik, Eduard; and Ong, Daniel, 3,882,317.

Ono, Hisatake: *See—*
Watarai, Syu; and Ono, Hisatake, 3,882,087.

Ono, Histake: *See—*
Katsuyama, Harumi; and Ono, Histake, 3,882,144.

Onufer, George R. Vapor emission control system and method. 3,881,894, Cl. 55-88.000.

Oosterling, Pieter Adriaan; and Hooftman, Johannes Philippus, to H. Vissers, N.V. Spreading device. 3,881,659, Cl. 239-689.000.

Orain, Michel, to Societe Anonyme dite: Glaenzer Spicer. Compact axial retainer safety device for rotatable members. 3,881,792, Cl. 308-237.00R.

Orban, Istvan: *See—*
Ujhidy, Aurel; Szotyori, Laszlo; Szepvolgyi, Janos; Horvath, Karoly; Nagy, Ferenc; Orban, Istvan; and Simonyi, Istvan, 3,882,177.

Ormsby, Thomas R., to Eastman Kodak Company. Storage and retrieval of graphic information. 3,882,468, Cl. 340-173.0LM.

Ornig, Hermann: *See—*
Neff, Franz; and Ornig, Hermann, 3,882,298.

O'Rourke, Gerald D.: *See—*
Liles, Robert E.; and O'Rourke, Gerald D., 3,882,391.

Osepchuk, John M.; and Kohane, Theodore, to Raytheon Company. Electrically tuned microwave energy device. 3,882,352, Cl. 315-39.550.

Otis Engineering Corporation: *See—*
Dollison, William W., 3,881,511.

Otsuka, Yoshinori; Hayashi, Masakatsu; Mantoku, Jun Ichi; Yamazaki, Susumu; Tomita, Akira; and Musou, Masanori, to Hitachi, Ltd. Air conditioner for automotive vehicles. 3,881,546, Cl. 165-42.000.

Ottesen, Hjalmar H., to International Business Machines Corporation. Readback circuits for digital signal recorders. 3,882,540, Cl. 360-39.000.

Outboard Marine Corporation: *See—*
Kashmerick, Gerald E., 3,881,846.

Owens-Corning Fiberglas Corporation: *See—*
Costin, Darryl J.; and Ford, James B., 3,881,918.
Stalego, Charles J., 3,881,903.
Stotler, David V.; Gelin, Robert J.; and Daugherty, John W., 3,881,603.

Owens-Illinois, Inc.: *See—*
Cooley, Richard F., 3,882,415.
Heidelberg, Eric X., 3,881,914.
Uhlig, Albert R., 3,882,213.

Oxirane Corporation: *See—*
Schmidt, John P., 3,881,996.

P. R. Mallory & Co. Inc.: *See—*
Bannon, Albert C., 3,881,243.

Paap, Hans J., to Texaco Inc. Dual scintillation detector, single photomultiplier density logging system. 3,882,309, Cl. 250-264.000.

Palm, Ronald K., to Engineering Development Associates Incorporated. Time interval sampling mechanism. 3,881,356, Cl. 73-423.00R.

Palmer, Christopher Steven, to Swish Products Ltd. Curtain or drape suspension arrangements. 3,881,218, Cl. 16-93.00D.

Palmer, Graham Eastwood, to Fosceo International Limited. Bonded particulate material. 3,881,947, Cl. 106-84.000.

Palu, Attilio Dal, to Fister S.n.c. di Bosso Giacomo & C. Windshield wiper blade made of synthetic material, with the supporting structure formed as an integral element. 3,881,214, Cl. 15-250.420.

Pannozzo, Anthony N.; and Jannetto, Anthony M. Method of nerve therapy using trapezoidal pulses. 3,881,495, Cl. 128-422.000.

Pantek, Henry R. Instrument for inscribing geometrical loops. 3,881,255, Cl. 33-27.00R.

Paramonoff, Elpidifor, to Standun, Incorporated. Scrap disposal mechanism for metallic can body trimmers. 3,881,380, Cl. 83-150.000.

Paridaens, Cornelis Johannes Henricus, to U.S. Philips Corporation. Cathode-ray tube with internal cylindrical resistor between high voltage connection and electron gun. 3,882,348, Cl. 313-450.000.

Park-Ohio Industries, Inc.: *See—*
Avalon, Robert J., 3,882,297.
Chiboroski, Joseph W., 3,882,291.

Parker, Douglas W. Fishing lure eye assembly. 3,881,272, Cl. 43-42.340.

Parker, Guy Malcolm. Stabilized optical viewing device. 3,881,803, Cl. 350-16.000.

Parrish, Donald B.: *See—*
Olstowski, Franciszek; and Parrish, Donald B., 3,882,071.
Olstowski, Franciszek; and Parrish, Donald B., 3,882,072.

Parrish, Lloyd. Tag axle emergency traction device. 3,881,565, Cl. 180-24.120.

Parry-Evans, Anthony Michael: *See—*
Lloyd, Arthur Leslie; Parry-Evans, Anthony Michael; and Capewell, Terence John, 3,881,517.

Parry, Keith Aled Wyn: *See—*
Bird, Michael Gavin; and Parry, Keith Aled Wyn, 3,882,032.

Passler, Helmar; Hanke, Rudolf; and Heger, Adolf, to VEB Textilkombinat Cottbus. Apparatus for treatment of flexible materials in liquid media. 3,881,329, Cl. 68-175.000.

Patel, Virendra; Fetter, Marion Cook; and Nand, Shradha, to Miles Laboratories, Inc. Direct agglutination immunological reagent. 3,882,225, Cl. 424-12.000.

Patenaude, Raymond A.: *See—*
Cozzi, Thomas W.; Tassie, Douglas P.; and Patenaude, Raymond A., 3,881,395.

Paton, Anthony David; and Temple, Stephen. Weaving. 3,881,523, Cl. 139-12.000.

Paul, Claude: *See—*
Lepeytre, Jean-Michel; Paul, Claude; Grandet, Louis; and Minjolle, Louis, 3,881,696.

Paul, James M., Jr. Electro pulse arthritic physiotherapy system. 3,881,494, Cl. 128-421.000.

Paulson, Rueben E.: *See—*
Markfelt, Reinhold S.; Paulson, Rueben E.; and Benson, Henry E., 3,881,656.

Paulstra: *See—*
Lemaitre, Jean-Claude, 3,881,711.

Paumier, Inc.: *See—*
Paumier, Thomas B.; Bulso, Joseph D., Jr.; and Lewers, William R., 3,881,436.

Paumier, Thomas B.; Bulso, Joseph D., Jr.; and Lewers, William R., to Paumier, Inc. Workpiece transfer mechanism. 3,881,436, Cl. 113-115.000.

Peabody, Roger H.; Sutkin, Seymour; and Chubb, Charles, to United States of America, Navy. Crt multiple-scan display apparatus and method providing target discrimination. 3,882,502, Cl. 343-17.000.

Peacock, James C.: *See—*
Deskevich, Stephen; Peacock, James C.; Tynan, Richard F.; and Wilson, Alan D., 3,882,358.

Peake, Charles C.; and Bolan, Harry H., to Westinghouse Electric Corporation. Method for installing a tube clamp. 3,881,240, Cl. 29-468.000.

Pearson, David B., to Weston Instruments, Inc. Meter construction. 3,882,389, Cl. 324-151.00A.

Peddinghaus, Werner. Indexing system for shears, presses and the like. 3,881,589, Cl. 198-127.00R.

Pelton, John Franklin, to Union Carbide Corporation. Chromium-chromium carbide powder. 3,881,910, Cl. 75-.50R.

Pender, David R. Modular housing structure. 3,881,283, Cl. 52-79.000.

Pendergrast, Robert A., to United States Steel Corporation. Method of combating hypomagnesemia in cattle. 3,882,232, Cl. 424-158.000.

Pennwalt Corporation: *See—*
Spulgis, Ivars Sigurds, 3,881,899.

Pep Industries, Inc.: *See—*
Bourner, Howard L., 3,882,438.

Pequignot, Michel: *See—*
Commarmot, Roger; and Pequignot, Michel, 3,881,849.

Perez, Artemio R. Apparatus for peeling fruit or vegetables. 3,881,406, Cl. 99-594.000.

Perkins Research & Mfg. Co.: *See—*
Simmonds, James F., 3,882,287.

Perrella, Donald J.; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Derivatives of 6-amino penicillanic acid. 3,882,100, Cl. 260-239.100.

Perry, Wayne E.: *See—*
Koster, Charles A.; and Perry, Wayne E., 3,882,394.

Peska Associates, Inc.: *See—*
Finebloom, Maureen, 3,881,266.

Petersen, Arthur W.: *See—*
Schoenholz, Daniel; Petersen, Arthur W.; and Northup, Marcus Allen, Jr., 3,881,948.

Petersen, Clarence C. Shell catcher for guns. 3,881,268, Cl. 42-1.00T.

Petersilka, Franz: *See*—
Benedetti, Riccardo; Meyer, Rudolf; Petersilka, Franz; Schittenhelm, Rudolf; Taumann, Leonhard; and Schiegl, Wolf-Eberhard, 3,882,314.

Peterson, Harley G., to Joy Manufacturing Company. Tensioning device. 3,881,673, Cl. 248-94.000.

Petrella, Robert G., to Air Products and Chemicals, Inc. Floor polish. 3,882,067, Cl. 260-28.50R.

Petricciani, John C.: *See*—
Krezanoski, Joseph Z.; and Petricciani, John C., 3,882,036.

Petro-Tex Chemical Corporation: *See*—
Banta, Edward M., 3,882,069.

Petrolite Corporation: *See*—
McLaren, Robin A.; and Alcott, Charles A., 3,882,128.

Petroskey, Wade T.: *See*—
Raynor, Robert J.; and Petroskey, Wade T., 3,882,052.

Pettit, Bruce Harold. Multiple drum washing apparatus for vehicles. 3,881,950, Cl. 134-115.00R.

Pews, Richard Garth; McKendry, Lennon H.; and Rodia, Ralph M., to Dow Chemical Company, The. Process for the preparation benzene isocyanaurates. 3,882,117, Cl. 260-248.0NS.

Pews, Richard Garth; McKendry, Lennon H.; and Rodia, Ralph M., to Dow Chemical Company, The. Process for the preparation of aminopyridines. 3,882,135, Cl. 260-296.00R.

Pews, Richard Garth; McKendry, Lennon H.; and Rodia, Ralph M., to Dow Chemical Company, The. Process for preparing carbanilates. 3,882,165, Cl. 260-471.00C.

Pezdark, Ben C.; and Cleary, William C., to Anaconda Company, The. Fluid operated steering clutch and brake. 3,881,583, Cl. 192-13.00R.

Pfaff, Carl F. Convertible crutch. 3,881,504, Cl. 135-53.000.

Pfeffer, Josef; and Schwable, Horst, to Rafi Raimund Finsterholzl Elektrotechn. Spezialfabrik. Hall plate contact-less operator and method of its adjustment. 3,882,337, Cl. 310-273.000.

Pfeifer, Josef: *See*—
Maier, Albert; Luder, Gunther; and Pfeifer, Josef, 3,881,813.

Pfister, Karl, III; Veber, Daniel F.; and Hirschmann, Ralph F., to Merck & Co., Inc. α-Methyl glutathione, analogs thereof, intermediates therefore and processes for their preparation. 3,882,097, Cl. 260-112.500.

Pfizer Inc.: *See*—
Holland, Gerald Fagan, 3,882,230.
Mylari, Banavara L., 3,882,115.

Pflanz, Herbert M., to Allis-Chalmers Corporation. Transient damping means for an electrical installation. 3,882,427, Cl. 333-12.000.

Pharriss, Bruce B., to Upjohn Company, The. Use of prostaglandins E and F for prevention of pregnancy in humans. 3,882,241, Cl. 424-305.000.

Phillipps, Gordon Hanley; and Newall, Christopher Earle, to Glaxo Laboratories Limited. Chemical compounds. 3,882,151, Cl. 260-397.450.

Phillips Petroleum Company: *See*—
Campbell, Mahlon E.; and Walker, William D., 3,882,030.
Dockery, Calvin D., 3,881,622.
Hessert, James E., 3,881,552.
Katz, Howard M., 3,881,430.
Mills, King L., 3,882,001.
Moberly, Charles W., 3,882,092.
Souder, Wallace W., 3,881,345.

Phillips, William David: *See*—
McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,882,042.
McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,882,043.
McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,882,044.

Picandet, Jean, to Jeumont-Schneider. System for detecting looping of a subscriber's telephone line. 3,882,282, Cl. 179-18.0HB.

Pickering & Company, Inc.: *See*—
Chass, Jacob, 3,882,436.

Piesch, Steffen; and Engelhardt, Friedrich, to Cassella Farbwerke Mainkur AG. Sulfonyl compounds. 3,882,120, Cl. 260-251.00R.

Pigeon, Gerard. Level Indicating device. 3,881,259, Cl. 33-397.000.

Pinckney, Robert L., to Boeing Company, The. Joint construction and method of fabrication. 3,881,973, Cl. 156-86.000.

Pine Instrument Company: *See*—
Hines, Theodore G.; and Johnson, Dennis C., 3,882,011.

Pissiotas, Georg: *See*—
Martin, Henry; and Pissiotas, Georg, 3,881,909.

Plessey Handel und Investments A.G.: *See*—
Grundy, Brian; and Toy, Robert, 3,882,281.

Plessy Handel und Investments A.G.: *See*—
Galpin, Robert Keith Portway, 3,882,330.

Plimi, Frank Victor, Jr.; and Reinwall, Ernest William, Jr., to Illinois Tool Works Inc. Dispensing device. 3,881,641, Cl. 222-207.000.

Plust, Heinz G.: *See*—
Haschka, Friedrich; Linkohr, Rolf; and Plust, Heinz G., 3,881,960.

Polaroid Corporation: *See*—
Douglas, Lawrence M., 3,882,518.
Erlichman, Irving, 3,882,522.
Land, Edwin H.; and Morse, John B., 3,882,517.
Lippert, Irving S.; and Stella, Joseph A., 3,882,526.
Young, Richard W., 3,881,932.

Polk, Donald E.; and Bedell, John R., to Allied Chemical Corporation. Method of continuous casting metal filament on interior groove of chill roll. 3,881,542, Cl. 164-87.000.

Pollinger, Hans; and Splanemann, Karlheinz, to Knorr-Bremse GmbH. Load responsive air brake system for vehicles including a spring-loaded cylinder. 3,881,785, Cl. 303-22.00R.

Polney, Richard J.: *See*—
Price, Samuel T.; and Polney, Richard J., 3,881,231.
Price, Samuel T.; Polney, Richard J.; and Hoffsommer, Walter A., 3,881,232.

Pols, Albert C.; and Feenstra, Robijn, to Shell Oil Company. Rotary bit for hydraulically drilling holes into underground formations. 3,881,561, Cl. 175-393.000.

Polysius AG: *See*—
Ritzmann, Horst, 3,881,861.

Polytop Corporation: *See*—
LaVange, Donald H., 3,881,643.

Pomogailo, Anatoly Dmitrievich; Mambetov, Urakbai Alimbaevich; Sokolsky, Dmitry Vladimirovich; Bolshov, Alexandr Avraamovich; Gluzman, Moisei Kharitonovich; Kochurovskaya, Gerta Gennadievna; Gluzman, Evgeny Moiseevich; Matkovsky, Petr Evgenievich; Beikhold, Galina Albertovna; Afanasieva, Irina Ivanovna; Burymchenko, Mikhail Ivanovich; and Baishiganov, Esengeldy. Catalyst for polymerization and copolymerization of olefines and a method for preparing same. 3,882,046, Cl. 252-429.00C.

Poorvin, Ronald E., to Motorola, Inc. Switchable frequency tone detector with electronically controlled code plug and BCD converter. 3,882,466, Cl. 340-171.0PF.

Porret, Daniel: *See*—
Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, 3,882,137.

Port, David J.: *See*—
Cheney, Richard F.; Port, David J.; and Spencer, James R., 3,881,911.

Porter, Harold Felton; Rennie, Foster Wilson; and Williamson, Addison Heaton, to du Pont de Nemours, E. I., and Company. Apparatus for sink-float liquid contacting of solids. 3,881,876, Cl. 23-270.00R.

Porter, John H., to Ladd Research Industries, Inc. Viscosity regulated cooling system. 3,881,323, Cl. 62-216.000.

Porter, Lawrence C., to Upjohn Company, The. Mixer for continuous mixing of foam materials. 3,881,871, Cl. 23-252.00R.

Porter, Maurice Read: *See*—
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Porter, Virgle E., to Amtron, Inc. Telephone switching system. 3,882,286, Cl. 179-18.0GF.

Porter, William H., to W. H. Porter, Inc. Insulating structural assembly and stud member for forming same. 3,881,292, Cl. 52-461.000.

Possis Corporation: *See*—
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Powers Chemco, Inc.: *See*—
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Powers, Robert W.; and Giddings, Robert A., to General Electric Company. Method of preparing an electrophoretic suspension of beta-alumina particles. 3,881,661, Cl. 241-15.000.

PPG Industries, Inc.: *See*—
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Prachar, Otakar P., to General Motors Corporation. Method of measuring the mass flow rate of a constituent of a gaseous stream. 3,881,351, Cl. 73-194.00M.

Pratsch, Rudolf, to Siemens Aktiengesellschaft. Voltage overload arrester for a high-voltage switching system. 3,881,766, Cl. 317-58.000.

Pregmon, Walter, to du Pont de Nemours, E. I., and Company. Epoxy resin powder coating composition. 3,882,064, Cl. 260-28.000.

Premier Tool and Die Limited: *See*—
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Preuss, Friedrich, to Roland Offsetmaschinenfabrik Faber and Schleicher AG. Sheet delivery arrangement for printing presses. 3,881,722, Cl. 271-218.000.

Price, Samuel T.; and Polney, Richard J., to Enterprise Machine and Development Corporation. Cylindrical baffle for yarn texturing air jet. 3,881,231, Cl. 28-1.400.

Price, Samuel T.; Polney, Richard J.; and Hoffsommer, Walter A., to Enterprise Machine and Development Corporation. Resonant baffle for yarn texturing air jet. 3,881,232, Cl. 28-1.400.

Pricer, Wilbur David, to International Business Machines Corporation. Complementary field effect transistor memory cell. 3,882,467, Cl. 340-173.00R.

Prinz, Richard: *See*—
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Hartwell, Edward Wallace, 3,881,489.
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Proler, Sam. Method for enhancing reduction of ores, oxides and melting of metals by magnetic forces. 3,881,915, Cl. 75-11.000.

Prost, Maurice; and Urbain, Marcel, to Labaz. 4-Carbamoyl-1-(p-fluorobenzoylpropyl)decahydroquinaline derivatives. 3,882,129, Cl. 260-287.00R.

Proudfoot, Alexander David, to Commonwealth of Australia, The. Method and apparatus for detecting the presence of signal components of predetermined frequency in a multi-frequency signal. 3,882,283, Cl. 179-84.0VF.

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Quackenbush, Forrest W.; and Rand, Phillip G., to Purdue Research Foundation. Sulfonate esters as cholesterol-lowering agents. 3,882,238, Cl. 424-303.000.

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Rainville, Dewey, to Rainville Company, Inc. Molding apparatus with neck-gated mold. 3,881,854, Cl. 425-242.00B.

Raitto, Russell G., to Concord Laboratories, Inc. Method and apparatus for collecting urine. 3,881,465, Cl. 128-2.00F.

Ralph M. Parsons Company: *See—*
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Rasmussen, Rolf Bjorn. Cable system for the transmission of electric energy from a stationary electric plant to a truck or another steerable vehicle driving freely within the range of the cable system. 3,882,288, Cl. 191-2.000.

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Rebentisch, Hans W.; and Steinmeyer, Gerhard W., to USM Corporation. Electrostatic application of thermoplastic adhesive. 3,881,447, Cl. 118-638.000.

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Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dieter, to Espe Fabrik Pharmazeutischer Preparate GmbH. Self-hardening compound, particularly for dental-medical application. 3,882,080, Cl. 260-42.290.

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Smith, Kent F., to General Instrument Corporation. Data flow control in memory having two device memory cells. 3,882,472, Cl. 340-173.0CA.

Smith, Peter R., to Stone-Platt Crawley Limited. Fluid heaters. 3,881,451, Cl. 122-250.00R.

Smith, Trevor Stanley, to Lucas Aerospace Limited. Throttle valve arrangement. 3,881,508, Cl. 137-501.000.

Smith, Wayne E., Jr., to United States Steel Corporation. Adhesive composition comprising coal-tar pitch and olefinic copolymers. 3,882,066, Cl. 260-28.5AS.

SmithKline Corporation: *See—*
Brenner, L. Martin; and Loev, Bernard, 3,882,126.
Garris, Charles R., 3,882,316.

Smolker, Gary, to United States of America, Navy. Method and apparatus for protecting sensitive information contained in thin-film microelectonic circuitry. 3,882,323, Cl. 307-202.00A.

Smolker, Gary; and Chernick, Leon, to United States of America, Navy. Method and apparatus for combustibly destroying microelectronic circuit board interconnections. 3,882,324, Cl. 307-202.00A.

Snow, Austin Matthew, Jr.; and Uschold, Ronald Earl, to du Pont de Nemours, E. I., and Company. Hot melt adhesives of improved melt viscosity stability. 3,882,065, Cl. 260-28.50B.

Sobolev, Sergei Petrovich: *See—*
Kosyak, Jury Fedorovich; Sobolev, Sergei Petrovich; Rudkovsky, Ary Fedorovich; Ugolnikov, Viktor Vasilievich; Iglinsky, Yakov Lvovich; Babadzhanian, Nikolai Artemovich; German, Semen Iosifovich; Ochkovsky, Ivan Fedorovich; and Zilber, Teodor Markovich, 3,881,842.

Societa Italiana Resine, S.I.R. S.p.A.: *See—*
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Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
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Societe Anonyme de Telecommunications: *See—*
Allanic, Jacques; Beraudy, Philippe; and Guillon, Louis, 3,881,851.

Societe Anonyme des Mines de Fer de Mauritania: *See—*
Gittard, Roland, 3,881,672.

Societe Anonyme dite: Glaenzer Spicer: *See—*
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Societe Anonyme dite: L'Oreal: *See—*
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Societe Anonyme: Poclain: *See—*
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Cresp, Michel M., 3,881,556.

Societe Ben: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
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Societe Lannionnaise d'Electronique Sle-Citerel: *See—*
Secher, Fernand, 3,882,359.

Soda, Shigenari; Seki, Tatsujiro; Daiguji, Shigeru; and Hayashi, Motoshige, to Sekisui Kaseihin Kogyo K.K. Apparatus for preparation of synthetic wood. 3,881,984, Cl. 156-500.000.

Sohma, Hiroshi: *See—*
Nishida, Toyomi; Sohma, Hiroshi; and Ito, Hayami, 3,881,862.

Sokolsky, Dmitry Vladimirovich: *See—*
Pomogailo, Anatoly Dmitrievich; Mambetov, Urakbai Alimbaevich; Sokolsky, Dmitry Vladimirovich; Bolshov, Alexandr Avraamovich; Gluzman, Moisei Kharitonovich; Kochurovskaya, Gerta Gennadievna; Gluzman, Evgeny Moiseevich; Matkovsky, Petr Evgenievich; Beikhold, Galina Albertovna; Afanasieva, Irina Ivanovna; Burymchenko, Mikhail Ivanovich; and Baishiganov, Esengeldy, 3,882,046.

Soldan, Donald W., to Mallinckrodt Chemical Works. Shipping container for a bottle of radioactive material. 3,882,315, Cl. 250-506.000.

Song Corporation: *See—*
Hongu, Masayuki; and Kawakami, Hiromi, 3,882,410.

Sony Corporation: *See—*
Hamada, Osamu, 3,882,400.
Jacob, Rene F.; and Fillion, Pierre C., 3,881,614.
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SoRelle, Frankie: *See—*
Martin, Roy H., 3,881,284.

SOS Consolidated, Inc.: *See—*
Schmidt, Harold F., 3,881,221.

Souder, Wallace W., to Phillips Petroleum Company. Position measuring apparatus. 3,881,345, Cl. 73-94.000.

Soudijn, Willem; Van Wijngaarden, Ineke; and Janssen, Paul Adriaan Jan, to Janssen Pharmaceutica N.V. [(Phenothiazinyl)propyl]-triazaspiro [4,5]-decan-4-ones. 3,882,109, Cl. 260-243.00A.

Southwire Company: *See—*
Cofer, Daniel B.; Mitchell, Francis Marion; Ward, George C.; and Kozak, Milan, 3,881,336.
Cofer, Daniel B.; Mitchell, Francis Marion; Ward, George C.; and Kozak, Milan, 3,881,337.

SPA - Societa Prodotti Antibiotics S.p.A.: *See—*
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Spada, Andrea. Tie arrangements and tie-holding device therefor. 3,881,196, Cl. 2-153.000.

Speilman, Robert A.: *See—*
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Spencer, James R.: *See—*
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Speros, Dimitrios M.; Caldwell, Robert M.; Springer, Robert H.; and Taylor, Robert P., to General Electric Company. Tin chloride molecular radiation lamp. 3,882,343, Cl. 313-229.000.

Speros, Dimitrios M.: *See—*
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Sperry Rand Corporation: *See—*
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Spitalul de Copii "Calarasi": *See—*
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Spitzer, Stuart Marshall: *See—*
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Splanemann, Karlheinz: *See—*
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Spribag Aktiengesellschaft: *See—*
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Springer, Robert H.: *See—*
Speros, Dimitrios M.; Caldwell, Robert M.; Springer, Robert H.; and Taylor, Robert P., 3,882,343.

Sprokel, Gerard J., to International Business Machines Corporation. Additive for liquid crystal materials. 3,882,039, Cl. 252-299.000.

Spulgis, Ivars Sigurds, to Pennwalt Corporation. Pneumatic apparatus for emptying particulate filters. 3,881,899, Cl. 55-387.000.

Square D Company: *See—*
Grass, William E.; and Karch, Walter C., 3,882,435.

Srivastava, Gopal Krishna, to GTE Sylvania Incorporated. Gated automatic tint control circuit. 3,882,534, Cl. 358-28.000.

Stalego, Charles J., to Owens-Corning Fiberglas Corporation. Apparatus for producing glass fibers. 3,881,903, Cl. 65-16.000.

Staley, James T.; Hunsicker, Harold Y.; and Brown, Robert H., to Aluminum Company of America. Method for making aluminum alloy product. 3,881,966, Cl. 148-12.700.

Staley, Lester K.: *See—*
Hopwood, Francis W.; Horwitz, Stuart S.; and Staley, Lester K., 3,882,431.

Stalling, David L.: *See—*
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Standard Oil Company: *See—*
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Stanford University: *See—*
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Stanly, Albert Leven; and Hromadka, Robert Judd, to Hycel, Inc. Heart monitoring system. 3,881,467, Cl. 128-2.06A.

Stanray Corporation: *See—*
Stimpson, Jack E., 3,881,592.

Starr, Eugene W., to PPG Industries, Inc. Method of tempering glass sheets. 3,881,907, Cl. 65-114.000.

Startsev, Valery Alexeevich: *See—*
Barannik, Ivan Andreevich; Belkin, Ivanovich; Borodin, Viktor Ivanovich; Voronova, natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stephanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,881,913.

Steen, William John, to Morgan Refractories Limited. Diffuser castings. 3,881,709, Cl. 266-34.00T.

Stehlin, Robert A., to Texas Instruments Incorporated. Level shifter transistor for a fluorescent lamp ballast system. 3,882,356, Cl. 315-205.000.

Stein, Jeffrey P., to Honeywell, Inc. Low power pulse generator. 3,882,421, Cl. 331-111.000.

Steinmeyer, Gerhard W.: *See—*
Rebentisch, Hans W.; and Steinmeyer, Gerhard W., 3,881,447.

Stella, Joseph A.: *See—*
Lippert, Irving S.; and Stella, Joseph A., 3,882,526.

Stelron Cam Co.: *See—*
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Stelzer, William; and Hayes, Edward J., to Kelsey-Hayes Company. Inertia responsive proportioning valve. 3,881,786, Cl. 303-24.00F.

Stephenson, John M.: *See—*
Fashbaugh, Richard H.; Gaberson, Howard A.; Stone, Philip L.; Williams, Donald E.; and Stephenson, John M., 3,881,776.

Steppan, Hartmut: *See—*
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Stettner & Co.: *See—*
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Stevens, Walter R. Automatic control of headlights, tail lights, parking lights and emergency warning flasher lights for vehicles. 3,882,452, Cl. 340-60.000.

Stewart-Warner Corporation: *See—*
Fontana, Frank J., 3,881,216.
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Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek: *See—*
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Stimpson, Jack E., to Stanray Corporation. Modular baggage handling system with chain drive. 3,881,592, Cl. 198-181.000.

Stockbridge, Bruce W., to Eastman Kodak Company. Melt spinning tower module and circular melt spin block therefor. 3,881,850, Cl. 425-72.000.

Stockwell, Glade M.; and Biderman, Benjamin B., to Rockwell International Corporation. Indicator type switch assembly with peripheral cam follower motion transfer switch actuation means. 3,882,292, Cl. 200-56.00R.

Stoddard, Xerxes T.: *See—*
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Stoffel Seals Corporation: *See—*
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Stokes, Roger Francis; and Hunt, Brian John, to Joseph Lucas (Industries) Limited. Method of joining a pair of silicon nitride parts. 3,881,904, Cl. 65-43.000.

Stone, Herman: *See—*
Largman, Theodore; Schmehl, Leon J.; and Stone, Herman, 3,882,076.

Stone, Joseph J., to A. B. Dick Company. System and method for measuring drying time. 3,881,349, Cl. 73-150.00R.

Stone, Philip L.: *See—*
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Stone-Platt Crawley Limited: *See—*
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Stone, William D.: *See—*
Dodd, Connie W.; and Stone, William D., 3,881,432.

Stoneburner, Leonard G., to Mead Corporation, The. Stimulation apparatus for a jet drop recorder. 3,882,508, Cl. 346-75.000.

Storz, Gunther: *See—*
Gordon, Harry W.; and Storz, Gunther, 3,881,475.

Stotler, David V.; Gelin, Robert J.; and Daugherty, John W., to Owens-Corning Fiberglas Corporation. Doffing mechanism. 3,881,603, Cl. 214-1.00D.

Straniti, Salvatore, to Avco Corporation. Damped compressor bearing mounting assembly. 3,881,841, Cl. 415-131.000.

Strenkoski, Leon Francis: *See—*
Freake, Ronald; Strenkoski, Leon Francis; Aitken, Daniel Glen; and Haden, Billy Harper, 3,881,993.

Strycker, Wallace Glenn: *See—*
Havera, Herbert John; and Strycker, Wallace Glenn, 3,882,234.

Stump, Eugen, to Suddeutsche Kuklerfabrik. Cap for liquid container. 3,881,507, Cl. 137-493.400.

Stumpf, Gunter Otto. Method of automatically cutting out material pieces from a web in conformance with a scanned cutting pattern. 3,881,379, Cl. 83-49.000.

Stutzke, Paul: *See—*
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Subramanian, Sundaram, to Zenith Radio Corporation. Swif with transducers having varied duty factor fingers for trap enhancement. 3,882,433, Cl. 333-72.000.

Suddeutsche Kuklerfabrik: *See—*
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Sugioka, Mitsuo: *See—*
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Sugiyama, Mitsunori: *See—*
Masuda, Takao; Ohkubo, Kinji; Sugiyama, Mitsunori; and Shishido, Tadao, 3,881,938.

Suh, John T., to Colgate-Palmolive Company. β-Substituted-dihydroxyphenyl-alanines. 3,882,172, Cl. 260-519.000.

Sulzer Brothers Limited: *See—*
Bracher, Hans; and Baumann, Heinz, 3,881,524.

Sumikawa, Kenji: *See—*
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Sumitomo Chemical Company Limited: *See—*
Maeda, Tadao; Kiyotaki, Tomoaki; Katsuhara, Yasuo; Mitsunaga, Takayoshi; and Iwade, Mitsuo, 3,882,243.

Sumitomo Electric Industries, Ltd.: *See—*
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Sumpter, Daniel O.; and Rodriguez, Don R. Form anchor. 3,881,681, Cl. 249-3.000.

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Sunada, Masayoshi: *See—*
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Sunbeam Corporation: *See—*
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Surface Systems, Inc.: *See—*
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Sutkin, Seymour: *See—*
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Suzuki, Shigeyoshi: *See—*
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Suzuki, Shizuo: *See—*
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Suzuki, Takeshi; Tanaka, Hiroshi; and Kudo, Makoto, to Tokyo Shibaura Electric Co., Ltd. Color stripe cathode ray tube having bridged strip apertures. 3,882,347, Cl. 313-403.000.

Suzuki, Toru: *See—*
Nohara, Shigezo; Hirata, Shunsaku; Yazaki, Jinichi; and Suzuki, Toru, 3,882,259.

Suzuki, Toshihiro, to Kabushiki Kaisha Suwa Seikosha. Electro-optical display device. 3,881,806, Cl. 350-160.0LC.

Suzuki, Toshitaka: *See—*
Ando, Shimon; Kurokawa, Koji; Suzuki, Shizuo; Komatsu, Isamu; Suzuki, Toshitaka; Kawano, Shigeyoshi; Sunada, Masayoshi; and Natsuno, Kengi, 3,881,568.

Svanholm, Erik V. Buoyancy body. 3,881,439, Cl. 114-69.000.

Svenska Cellulosa Aktiebolaget: *See—*
Backlund, Sture Olof Erik, 3,881,986.

Svenstam, Sven Gunnar, to Granges Essem Aktiebolag. Steps, stairs and the like, and a method of constructing same. 3,881,235, Cl. 29-157.30R.

Swartz, George Allan; and Wen, Cheng Paul, to RCA Corporation. Varactor tuned impatt diode microwave oscillator. 3,882,419, Cl. 331-96.000.

Swartz, Paul Russel, to Johns-Manville Corporation. Sizing composition for glass fibers of polypropylene emulsion and silane coupling agent. 3,882,068, Cl. 260-29.6XA.

Sweco, Inc.: *See—*
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Swinehart, Ross P., to Wisco Industries, Inc. Sliding nest feeding apparatus. 3,881,606, Cl. 214-1.0BB.

Swish Products Ltd.: *See—*
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Swoager, Jon R., to Automation Equipment, Inc. Control system for variable displacement hydraulic pump. 3,881,317, Cl. 60-444.000.

Swodenk, Wolfgang: *See—*
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Sybron Corporation: *See—*
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Szabo, Ervin I., to Canadian Patents and Development Limited. Method of electrophoretically forming foundry moulds. 3,882,010, Cl. 204-181.000.

Szekely, Geza: *See—*
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Szenas, Tibor: *See—*
Brieger, Lajos; Doktor, Karoly; Szekely, Geza; Szenas, Tibor; Bekefi, Gabriella; and Zoranyi, Dezso, 3,881,875.

Szepvolgyi, Janos: *See—*
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Szeverenyi, Nikolaus A., to GTE Sylvania Incorporated. Thermally expansive sensor. 3,882,479, Cl. 340-244.00R.

Szmuszkovicz, Jacob, to Upjohn Company, The. 7-Phenyl-3-[2-(dialkylamino)-alkyl]-3,4-dihydroas-triazino[4,3-a][1,4]benzodiazepin-2(1h)-ones. 3,882,112, Cl. 260-248.0AS.

Szotyori, Laszlo: *See—*
Ujhidy, Aurel; Szotyori, Laszlo; Szepvolgyi, Janos; Horvath, Karoly; Nagy, Ferenc; Orban, Istvan; and Simonyi, Istvan, 3,882,177.

Taiyo Musen Co. Ltd.: *See—*
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Tajima, Mutsunari; and Komatsu, Isao, to Nippon Electric Company, Ltd. Analog signal comparator circuit. 3,882,405, Cl. 328-146.000.

Takabayashi, Teruo; and Fukushima, Hiroyuki, to Kohshoh Limited. Clip. 3,881,228, Cl. 24-250.000.

Takada, Masami, to Nippon Electric Company, Ltd. Fault-detecting system for a multi-channel relay system. 3,882,456, Cl. 340-146.10R.

Takasu, Isamu, to Toyo Glass Machinery Co., Ltd. Speed reduction mechanism. 3,881,363, Cl. 74-63.000.

Takatori, Ken; Hirose, Tetsuzo; and Nakamata, Tsuyoshi, to Nippon Kokan Kabushiki Kaisha. Joints for welding steel pipe piles. 3,881,756, Cl. 285-22.000.

Take, Katsuo: *See—*
Takita, Hitoshi; and Take, Katsuo, 3,882,077.

Takeumra, Yasuo, to Tokyo Shibaura Electric Co., Ltd. Color television image pickup apparatus providing frequency interleaved color carriers and sidebands. 3,882,535, Cl. 358-44.000.

Takiguchi, Hisashi: *See—*
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Takiren Co., Ltd.: *See—*
Kato, Katsumi; and Sato, Naoaki, 3,881,830.

Takita, Hitoshi; and Take, Katsuo, to Toyo Boseki Kabushiki Kaisha; and Kureha Chemical Industry Co. Process for preparing carbon fiber-reinforced polyamide resins. 3,882,077, Cl. 260-37.00N.

Takiyama, Eiichiro; Hokamura, Sadakazu; and Hanyuda, Toshiaki, to Showa High Polymer Co., Ltd. Radiation curable epoxy ester-saturated alkyd compositions. 3,882,187, Cl. 260-835.000.

Talley, Walter J., Jr., to Sweco, Inc. Wastewater concentrator with slotted distributor. 3,882,025, Cl. 210-354.000.

Tan, Sing Liong, to U.S. Philips Corporation. Color television camera and a strip-filter suitable therefore. 3,882,537, Cl. 358-45.000.

Tanaka, Hiroshi: *See—*
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Tanaka, Koji: *See—*
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Tanaka, Susumu; and Konishi, Katsutoshi, to Minolta Camera Kabushiki Kaisha. Electrophotographic sensitive plate. 3,881,923, Cl. 96-1.500.

Tandetzke, Norbert Karl Albert, to Kangol-Teka, Sicherheitsgurt GmbH. Safety-belt locking device. 3,881,667, Cl. 242-107.400.

Tangen Drives, Inc.: *See—*
Miller, Paul Marcus, 3,881,596.

Tannenberger, Helmut: *See—*
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Taran, Jean-Pierre: *See—*
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Tashiro, Hiroyuki; and Urano, Susumu, to Nippondenso Co., Ltd. Indicating device. 3,882,490, Cl. 340-366.00B.

Tashiro, Kuniyoshi: *See—*
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Tassie, Douglas P.: *See—*
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Tate, Bernard: *See—*
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Tato, Masao; Hasegawa, Masaki; and Ichijyo, Taro, to Agency of Industrial Science & Technology. Optically cross-linkable polymer. 3,882,084, Cl. 260-47.0UA.

Tatsuta Electric Wire & Cable Co., Ltd.: *See—*
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Taumann, Leonhard: *See—*
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Tausheck, Russell W., to Ace Glass Co. Portable, one man operated, large sheet glass cutting table. 3,881,618, Cl. 214-505.000.

Tayama, Yukio: *See—*
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Ter Borg & Mensinga's Machinenfabriek N.V.: *See—*
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Ryabinin, Vladimir Alexandrovich; Sadofiev, Vladimir Ivanovich; Mitin, Igor Mikhailovich; Yankevich, Kira Boleslavovna; Matrosov, Evgeny Ivanovich; Leliovsky, Anton Felixovich; Terra, Karl Romanovich; and Kashirin, Alexei Petrovich, 3,882,351.

Terry, Ruel C.; and Stoddard, Xerxes T., to Ruel C. Terry; and Xerxes T. Stoddard. Method of extracting immobile hydrocarbons. 3,881,551, Cl. 166-272.000.

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Harrison, Herry D.: *See*—
Chappelow, Ronald E., Elijah, Elliott, Grochowski, Harrison, Tice, and York. T934,006.

Heffelfinger, Carl J., to E. I. du Pont de Nemours and Co. Polyethylene terephthalate film-metal laminate. T934,013, 5–6–75, Cl. 428—458.

Hovel, Harold J., to International Business Machines Corp. Heterojunction switching and memory device. T934,008, 5–6–75, Cl. 357—16.

Imperial Chemical Industries, Ltd.: *See*—
Wray, Peter. T934,011.

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Hovel, Harold J. T934,008.
Chappelow, Ronald E., Elijah, Elliott, Grochowski, Harrison, Tice, and York. T934,006.

Ltz, Donald C., to Westinghouse Electric Corp. Superconductive dynamoelectric machine with improved cryogenic support arrangement. T934,001, 5–6–75, Cl. 310—52.

Maskornick, Michael J., to E. I. du Pont de Nemours and Co. Laminated roll. T934,010, 5–6–75, Cl. 29—133.

Mumpower, Robert C., II. Method and apparatus for forming a diagonal flow filter from cylindrical tobacco smoke filter rods. T934,007, 5–6–75, Cl. 264—109.

Nam Sheng, Abel C., to RCA Corp. Composite transistor. T934,009, 5–6–75, Cl. 357—44.

RCA Corp.: *See*—
Nam Sheng, Abel C. T934,009.

Stephens, Harris, Jr., and M. D. Fink. Process for preparing powders. T934,003, 5–6–75, Cl. 264—9.

Thayer, Stephen C., to E. I. du Pont de Nemours and Co. Switch of reduced threshold voltage. T934,012, 5–6–75, Cl. 357—4.

Tice, Homer A.: *See*—
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Trail, George Cheatham, Jr. Tensometer. T934,002, 5–6–75, Cl. 73—144.

Westinghouse Electric Corp.: *See*—
Ltz, Donald C. T934,001.

Wray, Peter, to Imperial Chemical Industries, Ltd. Packet sealer. T934,011, 5–6–75, Cl. 53—39.

York, Ralph S.: *See*—
Chappelow, Ronald E., Elijah, Elliott, Grochowski, Harrison, Tice, and York. T934,006.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF MAY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alleaume, Jean H., to Technigaz. Method and device for supporting a conveyed tank against roll and pitch. Re. 28,411, 5–6–75, Cl. 114—74.

Analytical Instruments, Ltd.: *See*—
Jenkins, Anthony, and Cornell. Re. 28,417.

Buzano, Michel, to Rhone-Poulenc-Textile S.A. Process for producing texture yarn. Re. 28,406, 5–6–75, Cl. 28—72.170.

Clapham, Terrance N.: *See*—
Munnerlyn, Charles R., Robinson, Clapham, and Horwitz. Re. 28,415.

Cornell, Richard C.: *See*—
Jenkins, Anthony, and Cornell. Re. 28,417.

Cox, Harold D., D. S. Hammett, J. R. Dozier, and H. L. Shatto, Jr., to Shell Oil Co. Tension pipe laying method. Re. 28,410, 5–6–75, Cl. 61—72.3.

Dozier, J. Ronald: *See*—
Cox, Harold D., Hammett, Dozier, and Shatto. Re. 28,410.

Evans, John S., Jr., and L. L. Jasper, to Mark Products, Inc. Orienting apparatus. Re. 28,413, 5–6–75, Cl. 214—340.

Farr, Glyn P. R., to Girling Ltd. Brake adjusters. Re. 28,412, 5–6–75, Cl. 188—79.5.

Girling Ltd.: *See*—
Farr, Glyn P. R. Re. 28,412.

Hammett, Dillard S.: *See*—
Cox, Harold D., Hammett, Dozier, and Shatto. Re. 28,410.

Horwitz, James W.: *See*—
Munnerlyn, Charles R., Robinson, Clapham, and Horwitz. Re. 28,415.

Hougen, Everett D. Annular hole cutter. Re. 28,416, 5–6–75, Cl. 408—204.

Jasper, Leslie L.: *See*—
Evans, John S., Jr., and Jasper. Re. 28,413.

Jenkins, Anthony, and R. C. Cornell, to Analytical Instruments, Ltd. Method and apparatus for detecting tracer gas. Re. 28,417, 5–6–75, Cl. 250—302.

Keesling, Clifford E., and T. B., to Moore's Time Saving Equipment Co., Inc. Fabric cutting and measuring machine. Re. 28,414, 5–6–75, Cl. 242—56.

Keesling, Thomas B.: *See*—
Keesling, Clifford E., and T. B. Re. 28,414.

Kuhn, Jorg, and E. Sohm. Apparatus for cultivating plants. Re. 28,407, 5–6–75, Cl. 47—1.1.

Leeson, Richmond T., and H. H. Richter, by Leesona Corp., to Leesona Corp. Twister and method of twisting. Re. 28,409, 5–6–75. Cl. 57—77.4.

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Mark Products, Inc.: *See*—
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Munnerlyn, Charles R.: *See*—
Robinson, Bruce R., Munnerlyn, Clapham, and Horwitz. Re. 28,415.

Nelsson, Nels, to United States Gypsum Co. Bracket standard and partition member retainer. Re. 28,408, 5–6–75, Cl. 52—36.

Rhone-Poulenc-Textile S.A.: *See*—
Buzano, Michel. Re. 28,406.

Richter, Hans H.: *See*—
Leeson, Richmond T., and Richter. Re. 28,409.

Robinson, Bruce R.: *See*—
Munnerlyn, Charles R., Robinson, Clapham, and Horwitz. Re. 28,415.

Robinson, Bruce R., C. R. Munnerlyn, T. N. Clapham, and J. W. Horwitz, to Tropel, Inc. Blink compensating apparatus and method for objective refractor for the eye. Re. 28,415, 5–6–75, Cl. D351—6.

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Kuhn, Jorg, and Sohm. Re. 28,407.

Sollerud, Soren, to Svenska Utvecklingsaktiebolaget. Apparatus for washing patients hygienically. Re. 28,405, 5–6–75, Cl. 4—1.

Svenska Utvecklingsaktiebolaget: *See*—
Sollerud, Soren. Re. 28,405.

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Tropel, Inc.: *See*—
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Boll, Herschel L. Strawberry plant. 3,714, 5–6–75, Cl. 48.
Boll, Herschel L. Strawberry plant. 3,715, 5–6–75, Cl. 49.
Cook, Albert B., to Herschel L. Boll. Strawberry plant. 3,716, 5–6–75, Cl. 48.

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Adams, J. Henry. Rolling pin. 235,046, 5–6–75, Cl. D7—99.
Baynes, William H. Puzzle game. 235,075, 5–6–75, Cl. D34—15.
Beckman, Bengt E. Electric lamp. 235,071, 5–6–75, Cl. D26—8.
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Burkhalter, Kenneth E., F. L. Hibbard, C. Newman, C. L. Schaldenbrand, and W. R. Story. Text editing terminal. 235,068, 5–6–75, Cl. D26—5.
Burkhalter, Kenneth E. : *See*—
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Crandell, Norman V. Identification plaque. 235,083, 5–6–75, Cl. D96—12.
Davidson, Douglas A. Clothes bag. 235,052, 5–6–75, Cl. D7—198.
Davis, Dalton M. Wheel. 235,058, 5–6–75, Cl. D12—211.
Deschamps, Robert L. : *See*—
Thielmann, Ronald G., Thomsen, and Deschamps. 235,070.
Deschamps, Robert L., J. P. Thomsen, and R. G. Thielmann. Phonograph stylus. 235,070, 5–6–75, Cl. D26—14.
Donner, Aaron. Decorative panel for furniture door, drawer front, headboard or the like : 235,044, 5–6–75, Cl. D6—192.
Donner, Aaron. Dresser. 235,042, 5–6–75, Cl. D6—154.
Erlacher, Bernard E. : *See*—
Liljequist, Lawrence A., Neer, Thompson, Walter, Smart, Briggs, and Erlacher. 235,056.
Gatewood, Julia. Bed pan. 235,081, 5–6–75, Cl. D83—1.
Gunzel, Rudolph M., Jr. : *See*—
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Herman, Gilbert L. Fruit box or the like. 235,054, 5–6–75, Cl. D9—243.
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Lea, Melvin A. Spoon or similar article. 235,049, 5–6–75, Cl. D7—137.
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Levine, Irving. Bead strand for a curtain element or the like. 235,045, 5–6–75, Cl. D6—205.
Liljequist, Lawrence A. : *See*—
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Lockes, Leander. Hosiery. 235,038, 5–6–75, Cl. D2—342.
Manderfield, Ellen B. Spoon. 235,047, 5–6–75, Cl. D7—137.
Manderfield, Ellen B. Spoon or similar article. 235,051, 5–6–75, Cl. D7—150.
Martinelli, Arnold C. Shelving unit. 235,043, 5–6–75, Cl. D6—186.
Mayer, Frederick G. Water purifier. 235,062, 5–6–75, Cl. D23—3.
McCabe, Terrill R. Golf putter head. 235,074, 5–6–75, Cl. D34—5.
McCloskey, Edward W. Water depth indicator or the like. 235,055, 5–6–75, Cl. D10—101.
Moyer, Carter. Class ring. 235,077, 5–6–75, Cl. D45—10.
Nathan, Howard, and F. X. Schoen. Display case. 235,041, 5–6–75, Cl. D6—23.
Neer, Robert G. : *See*—
Liljequist, Lawrence A., Neer, Thompson, Walter, Smart, Briggs, and Erlacher. 235,056.
Neer, Robert G., L. A. Liljequist, N. D. Thompson, L. L. Walter, W. O. Smart, R. W. Briggs, and B. E. Erlacher. Lift truck. 235,056, 5–6–75, Cl. D12—57.
Newman, Charles : *See*—
Burkhalter, Kenneth E., Hibbard, Newman, Schaldenbrand, and Story. 235,068.
Neyret, Guy. Lighter for smokers. 235,072, 5–6–75, Cl. D27—42.
Nockleby, Raymond B. Pick up tool. 235,053, 5–6–75, Cl. D8—52.
Ohtsuka, Soji, and K. Johdai. Television receiver or similar article. 235,079, 5–6–75, Cl. D56—4.
Olsen, Robert J. Furniture assembly composed of seven interrelated articles. 235,039, 5–6–75, Cl. D6—4.
Radecki, Tony : *See*—
Gunzel, Rudolph M., Jr., Radecki, and Pinne. 235,063.
Rasmussen, Gunnar O. V. Heat convector. 235,066, 5–6–75, Cl. D23—127.
Rasmussen, Gunnar O. V. Heat convector. 235,067, 5–6–75, Cl. D23—127.
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Snyder, Donald E. Flexible spinning toy. 235,076, 5–6–75, Cl. D34—15.
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Strickland, Bobby L., and D. E. Simpson. Swivel shampoo bowl. 235,064, 5–6–75, Cl. D23—6.
Tanaka, Norihito. Paper clamp. 235,060, 5–6–75, Cl. D19—65.
Thomas, James A. : *See*—
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Thompson, Norman D. : *See*—
Liljequist, Lawrence A., Neer, Thompson, Walter, Smart, Briggs, and Erlacher. 235,056.
Thomsen, James P. : *See*—
Deschamps, Robert L., Thomsen, and Thielmann. 235,070.
Todeschini, Bruno. Telephone set, or similar article. 235,069, 5–6–75, Cl. D26—14.
Turner, Charles R. Building. 235,059, 5–6–75, Cl. D13—1.
Vailati, Secondo. Tape dispenser. 234,061, 5–6–75, Cl. D19—67.
Verona, Franco. Pen case with pen. 235,080, 5–6–75, Cl. D87—1.
Walter, Llewellyn L. : *See*—
Liljequist, Lawrence A., Neer, Thompson, Walter, Smart, Briggs, and Erlacher. 235,056.
Warren, John C. Game die or similar article. 235,073, 5–6–75, Cl. D34—5.
Weaver, Frank M. Combined automobile armrest and cooler box. 235,082, 5–6–75, Cl. D87—1.
Williams, Richard D. Riding toy. 235,057, 5–6–75, Cl. D12—108.
Wright, Thomas C. Greeting card display holder. 235,040, 5–6–75, Cl. D6—20.

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123 3,881,440
145A 3,881,441

CLASS 115
.5B 3,881,442
18E 3,881,443
37 3,881,444

CLASS 118
4 3,881,445
637 3,881,446
638 3,881,447

CLASS 119
14.19 3,881,448
60 3,881,449

CLASS 122
32 3,881,450
250R 3,881,451

CLASS 123
1A 3,881,452
32EA 3,881,453
73B 3,881,454
119CD 3,881,455
119A 3,881,456
136 3,881,457
148E 3,881,458
188R 3,881,459
196S 3,881,460
198D 3,881,461

CLASS 126
197 3,881,462

CLASS 128
2A 3,881,463
2B 3,881,464
2F 3,881,465
2V 3,881,466
2.05V 3,881,481
2.06A 3,881,467
23 3,881,468
25R 3,881,469
55 3,881,470
65 3,881,471
89R 3,881,472
90 3,881,473
130 3,881,475
132D 3,881,474
3,881,476
132 3,881,477
145R 3,881,478
145.8 3,881,479
3,881,480
212 3,881,482
214R 3,881,483
218M 3,881,484
270 3,881,485
283 3,881,486
284 3,881,487
287 3,881,488
3,881,489
3,881,490
3,881,491
419PG 3,881,493
421 3,881,494
422 3,881,495
423 3,881,496

CLASS 130
24 3,881,497

CLASS 131
134 3,881,498
173 3,881,499

CLASS 132
33B 3,881,500
48R 3,881,501
91 3,881,502

CLASS 134
2 3,881,948
31 3,881,949
57R 3,881,503
115R 3,881,950

CLASS 135
53 3,881,504

CLASS 136
20 3,881,951
26 3,881,952
3,881,953
27 3,881,954
83R 3,881,955
86A 3,881,959
86B 3,881,958
86D 3,881,957
86R 3,881,956
120FC 3,881,960
173 3,881,961

209 3,881,962

CLASS 137

137 3,881,506
375 3,881,505
386 3,881,509
460 3,881,511
493.4 3,881,507
501 3,881,508
590 3,881,510
596.13 3,881,512
608 3,881,513
614.04 3,881,514
625.44 3,881,516
625.66 3,881,515
637.1 3,881,517
821 3,881,518

CLASS 138

30 3,881,519
109 3,881,520
126 3,881,521
144 3,881,522

CLASS 139

12 3,881,523
126 3,881,524
420R 3,881,525

CLASS 140

92.2 3,881,526

CLASS 141

24 3,881,527
52 3,881,528
100 3,881,529
284 3,881,530
313 3,881,531

CLASS 144

2Z 3,881,532
3D 3,881,533

CLASS 148

1.5 3,881,963
3,881,964
12.7 3,881,965
3,881,966
31.55 3,881,967

CLASS 149

2 3,881,968
19.2 3,881,969
47 3,881,970

CLASS 150

33 3,881,534

CLASS 152

330 3,881,536
347 3,881,537
361FP 3,881,538
361R 3,881,492

CLASS 156

11 3,881,971
79 3,881,972
86 3,881,973
123 3,881,974
149 3,881,975
180 3,881,976
242 3,881,977
247 3,881,978
249 3,881,979
268 3,881,980
297 3,881,981
309 3,881,982
404 3,881,983
500 3,881,984

CLASS 160

107 3,881,539

CLASS 162

17 3,881,985
19 3,881,986
116 3,881,987
181A 3,881,988

CLASS 164

87 3,881,540
3,881,541
3,881,542
113 3,881,543
260 3,881,544
349 3,881,545

CLASS 165

42 3,881,546
80 3,881,547
110 3,881,548

CLASS 166

.5 3,881,549
272 3,881,550
3,881,551
294 3,881,552

CLASS 172

22 3,881,553

CLASS 173

13 3,881,554
38 3,881,555
3,881,556
131 3,881,557
152 3,881,558

CLASS 174

11R 3,882,262
3,882,263
68.5 3,882,264
88B 3,882,265

CLASS 175

67 3,881,559
337 3,881,560
393 3,881,561

CLASS 176

19LD 3,881,989

CLASS 177

83 3,881,562

CLASS 178

5.1 3,882,266
6 3,882,268
6.6A 3,882,267
6.6R 3,882,269
7.1 3,882,270
7.3D 3,882,271
7.3R 3,882,272
7.6 3,882,273
70TS 3,882,274

CLASS 179

1CN 3,882,276
1R 3,882,275
2DP 3,882,277
5R 3,882,278
15AL 3,882,280
15FD 3,882,279
18GF 3,882,286
18HB 3,882,282
18E 3,882,281
84VF 3,882,283
90B 3,882,284
107E 3,882,285
175.3A 3,882,287

CLASS 180

14 3,881,563
21 3,881,564
24.12 3,881,565
30 3,881,566
79.2R 3,881,567
98 3,881,568

CLASS 181

33K 3,881,569
135 3,881,570

CLASS 182

178 3,881,571
228 3,881,572

CLASS 186

1C 3,881,574
1R 3,881,573

CLASS 187

25 3,881,575

CLASS 188

73.5 3,881,576
79.5GT Re.28,412
112 3,881,577
165 3,881,578

CLASS 190

44 3,881,579
48 3,881,580

CLASS 191

2 3,881,581
3,882,288

CLASS 192

12C 3,881,582
13R 3,881,583
85AA 3,881,584

CLASS 193

35A 3,881,585

CLASS 195

1.7 3,881,990
31R 3,881,991
103.5R 3,881,992
139 3,881,993

CLASS 197

1A 3,881,586
1R 3,881,587
171 3,881,588

CLASS 198

127R 3,881,589
162 3,881,590
175 3,881,591
181 3,881,592
189 3,881,593
204 3,881,594
219 3,881,595
276 3,881,596

CLASS 200

11D 3,882,289
16C 3,882,056
47 3,882,290
50A 3,882,291
56R 3,882,292
154 3,882,293
157 3,882,294
159R 3,882,295
246 3,882,296

CLASS 202

160 3,881,994
248 3,881,995

CLASS 203

71 3,881,996

CLASS 204

1T 3,881,997
17 3,881,998
33 3,881,999
38A 3,882,000
59 3,882,001
98 3,882,002
159.14 3,882,005
159.15 3,882,006
3,882,007
159.16 3,882,003
3,882,004
181 3,882,008
3,882,009
3,882,010
195P 3,882,012
195R 3,882,011

CLASS 206

44B 3,881,597
45.2 3,881,598
273 3,881,599
303 3,881,600
497 3,881,601

CLASS 208

60 3,882,013
134 3,882,014
169 3,882,015

CLASS 209

3,882,016

CLASS 210

15 3,882,017
20 3,882,018
45 3,882,019
85 3,882,020
136 3,882,021
189 3,882,022
294 3,882,023
321 3,882,024
354 3,882,025
446 3,882,026
500 3,882,027

CLASS 213

75R 3,881,602

CLASS 214

1BB 3,881,606
1BC 3,881,604
3,881,607
1CM 3,881,605
1D 3,881,603
11R 3,881,609
14 3,881,608
17CA 3,881,611
17B 3,881,610
44A 3,881,612
83.3 3,881,613
138 3,881,614
147G 3,881,615
152 3,881,616
315 3,881,617
340 Re.28,413
505 3,881,618
620 3,881,619
3,881,620

CLASS 215

1C 3,881,621
31 3,881,622
216 3,881,623
221 3,881,624
3,881,625
256 3,881,626
329 3,881,627

CLASS 219

10.75 3,882,297
60R 3,882,299
76 3,882,298
130 3,882,300

CLASS 220

17 3,881,628
89A 3,881,629
268 3,881,630

CLASS 221

6 3,881,631
50 3,881,632
123 3,881,633

CLASS 222

3 3,881,634
99 3,881,635
129.4 3,881,636
136 3,881,637
153 3,881,638
3,881,639
158 3,881,640
207 3,881,641
370 3,881,642
505 3,881,643

CLASS 224

25A 3,881,644

CLASS 225

94 3,881,645
96 3,881,646

CLASS 226

172 3,881,647

CLASS 229

6R 3,881,648
38 3,881,649

CLASS 232

39 3,881,650

CLASS 235

61.11E 3,882,301
92DN 3,882,302
151.11 3,882,304
3,882,305
151.13 3,881,651
151.3 3,882,303

CLASS 238

349 3,881,652

CLASS 239

15 3,881,653
127 3,881,654
240 3,881,655
336 3,881,656
413 3,881,657
492 3,881,658
689 3,881,659

CLASS 240

44.2 3,882,307
48 3,882,306
52.1 3,882,450

CLASS 241

5 3,881,660
15 3,881,661
221 3,881,662
225 3,881,663
275 3,881,664

CLASS 242

56R Re.28,414
67.3R 3,881,665
68.2 3,881,666
107.4 3,881,667
118.6 3,881,668

CLASS 244

40R 3,881,669
77M 3,881,670
140 3,881,671

CLASS 246

172 3,881,672

CLASS 248

94 3,881,673
152 3,881,674
170 3,881,675
224 3,881,676
311 3,881,677
356 3,881,679
360 3,881,678
499 3,881,680

CLASS 249

3 3,881,681
94 3,881,682
117 3,881,683
214 3,881,684

CLASS 250

222R 3,882,308
264 3,882,309
302 Re.28,417
320 3,882,310
361 3,882,028
472 3,882,311
493 3,882,312
505 3,882,314
506 3,882,315
507 3,882,313
560 3,882,316
570 3,882,317
576 3,882,318
577 3,882,319

CLASS 251

48 3,881,685
61.1 3,881,686

CLASS 252

8.55R 3,882,029
12 3,882,030
45 3,882,031
49F 3,882,032
63.5 3,882,033
95 3,882,035
99 3,882,034
106 3,882,036
164 3,882,038
188 3,882,037
299 3,882,039
301.1W 3,882,040
301.4P 3,882,041
400R 3,882,042
402 3,882,043
3,882,044
429C 3,882,046
429R 3,882,045
435 3,882,047
455R 3,881,696
464 3,882,048
466PT 3,882,049
472 3,882,050
545 3,882,051

CLASS 254

1 3,881,687
45 3,881,689
83 3,881,690
94 3,881,691
101 3,881,692
135R 3,881,693
164 3,881,694
172 3,881,695

CLASS 256

13.1 3,881,697
59 3,881,698
3,881,699

CLASS 259

4 3,881,688
3,881,700
3,881,701
3,881,702
3,881,703
8 3,881,704
108 3,881,705
162 3,881,706
183 3,881,707
191 3,881,708

CLASS 260

2.1E 3,882,053
2.5AY 3,882,054
2.5BD 3,882,052
2.5N 3,882,055
17A 3,882,057
23H 3,882,058
23.7M 3,882,061
3,882,062
28 3,882,064
28.5AS 3,882,066
28.5A 3,882,128
28.5B 3,882,065
28.5R 3,882,067
29.6XA 3,882,068
29.7SQ 3,882,069
29.7T 3,882,070
30.6R 3,882,071
33.2R 3,882,072
33.6UA 3,882,073
34.2 3,882,074
37AL 3,882,060
37N 3,882,075
3,882,076
3,882,077
40P 3,882,079
40R 3,882,078
42.29 3,882,080
45.75V 3,882,081
45.95C 3,882,082
46.5UA 3,882,083
47UA 3,882,084
65 3,882,085
3,882,086
67.5 3,882,087
75N 3,882,088
75S 3,882,185
77.5CR 3,882,089
78R 3,882,090
79 3,882,091
79.1 3,882,092
79.3MU 3,882,093
85.1 3,882,094
88.2R 3,882,095
94.9D 3,882,096
112.5 3,882,097
3,882,098
146R 3,882,099
239BD 3,882,101
239.1 3,882,100
239.3A 3,882,102
240CA 3,882,104
240E 3,882,105
240G 3,882,103
240R 3,882,106
242 3,882,107
243A 3,882,109
243C 3,882,108
246B 3,882,113
247.1M 3,882,110
247.1R 3,882,114
248AS 3,882,111
3,882,112
3,882,115
248NS 3,882,117
248C 3,882,116
249.6 3,882,118
250P 3,882,119
251R 3,882,120
256.4Q 3,882,121
268TR 3,882,122
268H 3,882,123
281 3,882,124
283S 3,882,125
285 3,882,126
287R 3,882,127
293.72 3,882,130
294.8R 3,882,131
295.5B 3,882,132
296D 3,882,133
296R 3,882,134
3,882,135
299 3,882,136
307G 3,882,138
308R 3,882,139
309 3,882,140
309.5 3,882,137
309.6 3,882,141
311 3,882,142
325R 3,882,143
326.11S 3,882,144
326.4 3,882,145
326.62 3,882,146
340.5 3,882,147
345.2 3,882,148
346.2R 3,882,149
380 3,882,150
397.45 3,882,151
408 3,882,153
410 3,882,154
410.7 3,882,155
455R 3,882,156
3,882,157
456A 3,882,158
465.3 3,882,159
468E 3,882,152
3,882,160
471A 3,882,161
3,882,162
3,882,164
471C 3,882,163
3,882,165
479S 3,882,166
486H 3,882,169
486R 3,882,167
3,882,168
487 3,882,170
515A 3,882,180
518R 3,882,171
519 3,882,172
544Y 3,882,173
558R 3,882,174
561HL 3,882,176
561R 3,882,175
562CL 3,882,177
563R 3,882,178
570.9 3,882,179
583N 3,882,181
584C 3,882,182
671R 3,882,183
675.5 3,882,184
780 3,882,186
835 3,882,187
850 3,882,188
3,882,189
857PG 3,882,190
859PV 3,882,191
873 3,882,192
874 3,882,193
878R 3,882,194
3,882,195
895 3,882,196
897A 3,882,197
899 3,882,198
928 3,882,199
946 3,882,200
950 3,882,201
951 3,882,202

CLASS 261

34A 3,882,204
37 3,882,205
39B 3,882,206
961 3,882,203

CLASS 264

1 3,882,207
3C 3,882,208
24 3,882,063
45.9 3,882,209
63 3,882,210
91 3,882,211
94 3,882,212
97 3,882,213
106 3,882,214
113 3,882,215
3,882,216
117 3,882,217
157 3,882,218
171 3,882,219
221 3,882,220

CLASS 266

34T 3,881,709
41 3,881,710

CLASS 267

57.1R 3,881,711
131 3,881,713
154 3,881,712

CLASS 269

13 3,881,714

45 3,881,715

CLASS 270

12 3,881,716
58 3,881,717

CLASS 271

10 3,881,718
12 3,881,719
63 3,881,720
184 3,881,721
218 3,881,722

CLASS 272

1A 3,881,723

CLASS 273

1.5R 3,881,724
12 3,881,725
14 3,881,727
85F 3,881,726
95E 3,881,728
106D 3,881,729
106.5B 3,881,730
137R 3,881,731
158 3,881,732
168 3,881,733

CLASS 274

1R 3,881,734

CLASS 279

5 3,881,735

CLASS 280

6.1 3,881,736
11.35T 3,881,737
3,881,738
42 3,881,739
79.1 3,881,740
96.2A 3,881,741
106R 3,881,742
124F 3,881,743
150SB 3,881,745
150B 3,881,744
150.5 3,881,746
255 3,881,747
404 3,881,748
415B 3,881,749
423R 3,881,750
480 3,881,751

CLASS 285

22 3,881,756
46 3,881,752
92 3,881,753
114 3,881,754
137A 3,881,755

CLASS 289

17 3,881,757

CLASS 290

43 3,882,320

CLASS 292

87 3,881,758
321 3,881,759

CLASS 293

99 3,881,760

CLASS 294

88 3,881,761
93 3,881,762
116 3,881,763

CLASS 296

28A 3,881,765
28D 3,881,764
35R 3,881,767
39A 3,881,769
39R 3,881,768

CLASS 297

51 3,881,770
71 3,881,771
300 3,881,772
377 3,881,773

CLASS 299

4 3,881,774
18 3,881,775
31 3,881,776
33 3,881,777

CLASS 301

37B 3,881,778

CLASS 303

21AF 3,881,781
21F 3,881,779
3,881,780
3,881,782
3,881,783
22A 3,881,784
22R 3,881,785
24F 3,881,786

CLASS 307

10LS 3,882,321
65 3,882,322
202A 3,882,323
3,882,324
218 3,882,325
235R 3,882,326
236 3,882,327
237 3,882,328
247R 3,882,329
264 3,882,330
279 3,882,331

CLASS 308

6C 3,881,787
21 3,881,788
187.1 3,881,789
217 3,881,790
237R 3,881,791
3,881,792

CLASS 310

8.1 3,882,332
14 3,882,333
59 3,882,334
61 3,882,335
216 3,882,336
273 3,882,337

CLASS 312

217 3,881,793
259 3,881,794

CLASS 313

11.5 3,882,338
60 3,882,339
94 3,882,340
134 3,882,341
188 3,882,342
217 3,882,344
229 3,882,343
3,882,345
253 3,882,346
403 3,882,347
450 3,882,348
519 3,882,349

CLASS 315

13C 3,882,350
39 3,882,351
39.55 3,882,352
68 3,882,353
101 3,882,354
169TV 3,882,355
205 3,882,356
209R 3,882,357
241P 3,882,358
383 3,882,359
395 3,882,360

CLASS 317

27R 3,882,361
58 3,881,766
123 3,882,362
124 3,882,363

CLASS 318

221R 3,882,364
269 3,882,365
326 3,882,366
599 3,882,367
610 3,882,368

CLASS 321

6 3,882,369
45R 3,882,370
61 3,882,371

CLASS 323

8 3,882,372
66 3,882,373

CLASS 324

3 3,882,374
6 3,882,375
10 3,882,376
37 3,882,377
54 3,882,378
3,882,379
60C 3,882,380
61R 3,882,381
65R 3,882,382
3,882,383
71CP 3,882,385
71R 3,882,384
73R 3,882,386
117R 3,882,387
133 3,882,388
151A 3,882,389
158D 3,882,391
158R 3,882,390

CLASS 325

53 3,882,392
56 3,882,393
115 3,882,394
319 3,882,395
445 3,882,396
449 3,882,397
455 3,882,398
3,882,399
456 3,882,400
492 3,882,401

CLASS 328

13 3,882,402
14 3,882,403
38 3,882,404
146 3,882,405
150 3,882,406
221 3,882,407

CLASS 330

5.5 3,882,408
6 3,882,409
3,882,410
34 3,882,411

CLASS 331

1A 3,882,412
9 3,882,413
94.5E 3,882,415
94.5G 3,882,414
3,882,416
3,882,418
94.5T 3,882,417
96 3,882,419
99 3,882,420
111 3,882,421
116R 3,882,422

CLASS 332

7 3,882,423
11D 3,882,426
18 3,882,424
37D 3,882,425

CLASS 333

12 3,882,427
24.2 3,882,428
30R 3,882,429
3,882,430
31R 3,882,431
32 3,882,432
72 3,882,433
73W 3,882,434

CLASS 335

164 3,882,435

CLASS 336

83 3,882,436
123 3,882,437

CLASS 337

237 3,882,438
326 3,882,439
354 3,882,440

CLASS 338

6 3,882,441
41 3,882,442
42 3,882,443

CLASS 339

17C 3,881,795
97C 3,881,796
106 3,881,797
144R 3,881,798
252R 3,881,799

CLASS 340

3C 3,882,444
15 3,882,445
15.5DS 3,882,446
21 3,882,447
52A 3,882,448
52H 3,882,449
57 3,882,451
60 3,882,452
65 3,882,453
146.1AG 3,882,460
146.1AQ 3,882,457
146.1BE 3,882,455
146.1F 3,882,459
146.1R 3,882,456
3,882,458
146.3AC 3,882,463
146.3ED 3,882,461
146.3E 3,882,462
146.3Q 3,882,454
146.3Z 3,882,464
147R 3,882,465
171PF 3,882,466
173CA 3,882,472
173LM 3,882,468
173SP 3,882,471
173R 3,882,467
3,882,469
3,882,470
177CA 3,882,474
227R 3,882,475
235 3,882,476
237R 3,882,478
237S 3,882,477
244R 3,882,479
323 3,882,480
336 3,882,481
347AD 3,882,484
347CC 3,882,488
347DA 3,882,486
3,882,487
347DD 3,882,483
3,882,485
347P 3,882,482
347 3,882,489
366B 3,882,490
409 3,882,491
413 3,882,492

CLASS 343

5PD 3,882,493
3,882,494
3,882,495
6R 3,882,496
6.5LC 3,882,497
7A 3,882,498
7.4 3,882,500
9 3,882,501
17 3,882,502
100R 3,882,503
103 3,882,504
709 3,882,499
727 3,882,505
728 3,882,506

CLASS 346

74.1 3,882,507
75 3,882,508

CLASS 350

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6 3,881,801
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16 3,881,803
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149 3,881,805
160LC 3,881,806
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285 3,881,810
289 3,881,811

CLASS 351

6 Re.28,415
3,881,812

CLASS 353

27 3,881,813
95 3,881,814
97 3,881,815
122 3,881,816

CLASS 354

5 3,882,509
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197 3,882,520
293 3,882,524
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301 3,882,518
316 3,882,525
317 3,882,526
322 3,882,527

CLASS 355

2 3,881,819
12 3,881,817
17 3,881,818
41 3,881,820
115 3,881,821

CLASS 356

36 3,881,822
106R 3,881,823
141 3,881,824
227 3,881,825
246 3,881,826
3,881,827

CLASS 357

3 3,882,528
13 3,882,529
23 3,882,530
24 3,882,531
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CLASS 358

28 3,882,534
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CLASS 360

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78 3,882,541
96 3,882,542
98 3,882,473
109 3,882,543
118 3,882,544
137 3,882,545

CLASS 401

199 3,881,828

CLASS 403

27 3,881,829
171 3,881,830
180 3,881,831

CLASS 404

4 3,881,832
60 3,881,833
64 3,881,834
3,881,835

CLASS 408

42 3,881,836
67 3,881,838
144 3,881,837
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CLASS 415

53T 3,881,839
109 3,881,840
131 3,881,841
168 3,881,842
219R 3,881,843

CLASS 416

145 3,881,844
241 3,881,845

CLASS 417

478 3,881,846

CLASS 418

61A 3,881,847
123 3,881,848
182 3,881,849

CLASS 423

244 3,882,221
575 3,882,222
579 3,882,223

CLASS 424

8 3,882,224
12 3,882,225
19 3,882,226
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35 3,882,228
85 3,882,231
158 3,882,232
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312 3,882,243
317 3,882,230
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330 3,882,246
337 3,882,247
356 3,882,248

CLASS 425

72 3,881,850
113 3,881,851
149 3,881,852
174.8 3,881,853
242B 3,881,854
342 3,881,855
432 3,881,856

CLASS 426

7 3,882,249
39 3,882,250
72 3,882,251
140 3,882,252
235 3,882,255
274 3,882,257
572 3,882,258
583 3,882,256
633 3,882,254
637 3,882,253

CLASS 428

35 3,882,259
337 3,882,260

CLASS 431

7 3,881,857
348 3,881,858

CLASS 432

60 3,881,859
83 3,881,860
106 3,881,861
3,881,862
222 3,881,863
234 3,881,864

CLASSIFICATION OF DESIGNS

D2—	342	235,038	D7—	99	235,046	D9—	243	235,054	D23—	3	235,062		14A	235,069
D6—	4	235,039		137	235,047	D10—	101	235,055		18	235,063		D	235,070
	20	235,040			235,048	D12—	57	235,056		64	235,064	D27—	42	235,072
	23	235,041			235,049		108	235,057		71	235,065	D34—	5DT	235,073
	154	235,042			235,050		211	235,058		127	235,066		GH	235,074
	186	235,043		150	235,051	D13—	1E	235,059			235,067		15M	235,075
	192	235,044		198	235,052	D19—	65	235,060	D26—	5C	235,068		W	235,076
	205	235,045	D8—	52	235,053		67	235,061		8	235,071			

D45—	10B	235,077												
D48—	20R	235,078												
D56—	4D	235,079												
D83—	1U	235,081												
D87—	R	235,080												
		235,082												
D96—	12F	235,083												

CLASSIFICATION OF PLANTS

P. —	48	3,714	P. —		3,716	P. —	49	3,713	P. —		3,715			

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

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29—	133	T934,010	235—	151.1	T934,006	264—	9	T934,003	310—	52	T934,001		16	T934,008
53—	39	T934,011												

			428—	44	T934,009
				458	T934,013

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,881,342	3,881,559	3,882,353	3,882,199	3,881,425	3,881,950
3,881,348	3,881,575	3,882,367	3,882,224	3,881,533	3,881,957
3,881,416	3,881,600	3,882,383	3,882,230	3,881,660	3,881,994
3,881,816	3,881,609	3,882,404	3,882,265	3,882,232	3,882,015
3,882,465	3,881,618	3,882,408	3,882,269	3,882,257	3,882,060
2 : 3,881,589	3,881,647	3,882,417	3,882,271	3,882,545	3,882,096
4 : 3,881,334	3,881,648	3,882,439	3,882,293	15 : 3,881,442	3,882,136
3,881,353	3,881,662	3,882,452	3,882,302	3,881,752	3,882,163
3,881,460	3,881,673	3,882,460	3,882,363	17 : Re.28,408	3,882,171
3,881,504	3,881,675	3,882,473	3,882,376	3,881,197	3,882,184
3,881,518	3,881,701	3,882,478	3,882,429	3,881,236	3,882,194
3,881,808	3,881,706	3,882,487	3,882,542	3,881,249	3,882,211
3,882,319	3,881,725	3,882,491	10 : 3,881,876	3,881,280	3,882,212
3,882,394	3,881,747	3,882,503	3,881,949	3,881,349	3,882,220
3,882,470	3,881,753	3,882,507	3,882,065	3,881,355	3,882,266
5 : 3,881,272	3,881,773	3,882,512	3,882,093	3,881,370	3,882,286
3,881,443	3,881,776	3,882,539	3,882,116	3,881,375	3,882,289
3,881,713	3,881,797	3,882,541	3,882,140	3,881,383	3,882,295
6 : Re.28,414	3,881,799	3,882,544	3,882,160	3,881,392	3,882,299
3,881,203	3,881,805	8 : 3,881,202	3,882,162	3,881,397	3,882,377
3,881,206	3,881,811	3,881,466	3,882,197	3,881,401	3,882,382
3,881,217	3,881,815	3,881,551	3,882,247	3,881,410	3,882,390
3,881,250	3,881,820	3,881,654	3,882,357	3,881,424	3,882,392
3,881,252	3,881,868	3,881,663	11 : 3,881,477	3,881,428	3,882,399
3,881,253	3,881,869	3,881,678	3,882,374	3,881,455	3,882,422
3,881,269	3,881,871	3,882,017	3,882,497	3,881,471	3,882,433
3,881,286	3,881,951	3,882,040	12 : 3,881,289	3,881,476	3,882,455
3,881,288	3,881,962	3,882,285	3,881,293	3,881,484	3,882,457
3,881,291	3,881,968	3,882,540	3,881,297	3,881,505	3,882,477
3,881,306	3,881,972	9 : 3,881,216	3,881,298	3,881,535	3,882,515
3,881,354	3,882,009	3,881,239	3,881,390	3,881,565	18 : 3,881,219
3,881,359	3,882,018	3,881,313	3,881,406	3,881,580	3,881,225
3,881,361	3,882,019	3,881,420	3,881,468	3,881,581	3,881,238
3,881,364	3,882,024	3,881,434	3,881,494	3,881,585	3,881,243
3,881,367	3,882,025	3,881,520	3,881,502	3,881,597	3,881,338
3,881,380	3,882,026	3,881,593	3,881,596	3,881,598	3,881,472
3,881,389	3,882,029	3,881,623	3,881,714	3,881,621	3,881,489
3,881,394	3,882,036	3,881,625	3,881,745	3,881,628	3,881,602
3,881,407	3,882,081	3,881,653	3,881,770	3,881,641	3,881,762
3,881,419	3,882,154	3,881,684	3,881,794	3,881,649	3,881,765
3,881,452	3,882,156	3,881,708	3,881,908	3,881,658	3,881,822
3,881,463	3,882,157	3,881,763	3,882,073	3,881,676	3,881,853
3,881,467	3,882,200	3,881,772	3,882,207	3,881,728	3,881,880
3,881,470	3,882,244	3,881,841	3,882,218	3,881,740	3,881,881
3,881,473	3,882,275	3,881,895	3,882,274	3,881,758	3,881,882
3,881,516	3,882,287	3,881,919	3,882,385	3,881,769	3,881,952
3,881,519	3,882,301	3,881,980	3,882,466	3,881,783	3,881,993
3,881,522	3,882,323	3,882,052	3,882,529	3,881,835	3,882,037
3,881,527	3,882,324	3,882,059	13 : 3,881,336	3,881,846	3,882,049
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3,881,547	3,882,332	3,882,122	3,881,400	3,881,873	3,882,238

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49 : 3,881,592
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50 : 3,881,323
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3,881,837
3,881,884
3,882,326
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51 : 3,881,258
3,881,396
3,881,637
3,881,824
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3,882,365
3,882,373
3,882,471
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53 : 3,881,285
3,881,573
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3,881,374
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3,882,294
3,882,305
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3,882,435

DESIGN PATENTS

4	235,065		235,075	17	235,040	30	235,053		235,049	40	235,064
	235,082		235,078		235,070	33	235,073		235,050	41	235,056
6	235,045	8	235,083		235,076	36	235,039		235,051	47	235,057
	235,055	9	235,042	24	235,038		235,041		235,081	48	235,077
	235,058		235,044	26	235,068		235,047	39	235,074	53	235,046
	235,063		235,062	29	235,059		235,048				

PLANT PATENTS

13 : 3,713	17 : 3,714	3,715	18 : 3,716		

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

10	T934,005	34	T934,009		T934,008	39	T934,013		T934,012	47	T934,003
10	T934,010	36	T934,006	37	T934,002	42	T934,001	45	T934,004	51	T934,007

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U.S. DEPARTMENT OF COMMERCE

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, *Commissioner*